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The Journal-Lancet

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VOLUME LXIX

New Series

January 1949 - December 1949

The Official Journal of the
American College Health Association
Great Northern Railway Surgeons' Association
Minneapolis Academy of Medicine
North Dakota State Medical Association
Northwestern Pediatric Society
South Dakota Public Health Association
North Dakota Society of Obstetrics and Gynecology

Lancet Publishing Company, Publishers
Minneapolis, Minnesota

1949

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CATALOGUED MAR 29 1950 E.C.G.

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The JOURNAL LANCET

Minneapolis, Minnesota
January, 1949

Vol. LXIX, No. 1
New Series

Foreword

A fine innovation occurred on March 10, 1945, when the obstetrical and gynecological societies of Iowa, Minnesota, North Dakota and Wisconsin held a combined meeting in Minneapolis. This apparently set the precedence for regular meetings of these societies and might well be an example for societies in various other fields of medicine and surgery operating in the same general area. Rapid transportation has so reduced travel time that practically any point or city is quickly and easily reached by those residing elsewhere in the area. Physicians working in towns, cities and states develop new diagnostic, therapeutic and preventive procedures or modify old ones so as to improve them. Therefore, they have contributions to make to the knowledge of others, which add significantly to the value of a combined meeting of those working in several states. In addition to the formal presentation of papers and their discussions there is the opportunity before, between and after sessions to informally discuss controversial subjects and often to learn something new from those who do not appear on the program. Reports indicate that all of this and much more of mutual value also occurred at the second combined meeting of the obstetrical and gynecological societies held in Minneapolis on October 9, 1948.

A considerable number of the obstetricians and gynecologists of the four societies represented had been students of Dr. J. C. Litzenberg and all others had known him or his work; therefore a fine spirit prevailed throughout the day, in that the meeting was dedicated to his memory. There was time to recite anecdotes, to discuss his unique teaching ability, his conviviality, his keen personal interest in each student, the large practice that he conducted for so many years in a strictly ethical manner and his contributions to knowledge.

The scientific program consisted of 13 papers on numerous phases of obstetrics and gynecology by expert essayists of the four societies and a few who appeared by special invitation. In addition, Dr. M. Edward Davis of the Lying-In Hospital of Chicago, presented the final afternoon address on Steroid Therapy in Pregnancy Complications. Dr. Frederick M. Loomis, of Piedmont, California, was the evening banquet speaker. Thus, the four societies produced a program that would have been suitable for any national or international organization.

The officers, including Everett Hartley as president, and John Haugen, secretary, together with the entire membership of the Minnesota Society, were honored with the opportunity to arrange the program, and the Minneapolis members were especially complimented in that their city was chosen for the meeting.

The Journal-Lancet takes great pride in presenting this special issue on obstetrics and gynecology, which includes many of the papers read before the combined meeting. The publishers and the editorial board have the complete assurance that as this issue goes forth to its readers in all of the states of the nation and to some foreign countries, it will be received and read with great profit. The readers will be better informed and, hence, their teaching and practice will be approved. This applies not only to experts, but to that large and important group of general practitioners who have always done the lion's share of practice in the fields we now call specialties. Our great appreciation is due those who have made this special issue possible. They have contributed to the ideals and high standards which numerous persons have tried to maintain and improve since the Journal-Lancet first appeared in 1870.

J. A. Myers, M.D.,
Chairman, Board of Editors

The Value of Estrogen Therapy in the Treatment of Varicose Veins Complicating Pregnancy

H. O. McPheeters, M.D.
Minneapolis, Minnesota

TROUBLESOME varicosities often develop rapidly in the latter part of the first trimester and the early part of the second trimester in pregnancy. Also they often increase very rapidly from day to day until about the beginning of the last trimester, after which time the advancement seems to stop. The varicosities appear in the labia, sometimes even in the groin, and at any or a number of places in either one or both legs. These varicosities appear in varying size and at times may form "bunches" of veins and are frequently characterized by being painful when the patient is in the upright position, often to such a degree as to seriously handicap the pregnant woman in her usual activities. Another feature is the so-called "bursts" or telangiectasis in which the small venules often become dilated over large areas and give rise to an unsightly appearance. This last condition, although usually only of cosmetic importance, may be very painful toward the end of the day and even the cause of disability. In fact the general appearance of the extremity with the large tense varices, so much more extensive at times over the thigh and leg than one would expect from the size of the vein at the groin, together with the cyanotic color of the skin is so typical that we often suspect a pregnancy before the patient does.

The cause of varicose veins under any circumstances is unknown. Further, the rapid development of those associated with early pregnancy is even more obscure. Generally it is assumed that varicose veins, as hernia, are congenital defects, conditioned later by the individual's environment. In pregnancy, there are those who assume that an increase of pelvic pressure is responsible. Such an assumption does not seem logical because enlargement of the uterus to the same size due to other conditions, such as myoma, generally reveals no particular effect on the veins. Further, the development of serious vein conditions in pregnancy, even in twin pregnancy, is not common. Consequently the "pelvis pressure" hypothesis is untenable. Marazita,[3] writing in the *Medical Record* of July 1946 says: "It has been my opinion for some time that varicosities in pregnancy were not due to pressure of the gravid uterus upon the veins of the pelvis, nor to increased abdominal tension. The development of varicose veins and particularly telangiectases in some women in the eighth and twelfth weeks of pregnancy lead one to suspect that perhaps some circulating hormone plays a part. It was with this view that this work was done. Pathologically a varicose vein is one whose wall is thinned out and relaxed. What then causes this relaxation? Since the uterine muscle (the cervix) relaxes, Hegner's sign exists, and the joints also greatly relax, it is highly probable that an ovarian hormone is present and circulating in the blood stream in early pregnancy."

It is conceivable that standing for long periods may be effective in the aggravation of varicosities throughout pregnancy, but the fact that during the last war period many mothers stood long hours in industrial occupations in the early months of pregnancy without a notable increase in the incidence of painful varicose veins would not support such a thesis as the major activating factor. Foote[2] in "Letters to the Editor" published in London *Lancet* says, "Further information is required about the influence of hormones on varices. The fact that varices tend to swell at puberty, during menstruation, in early pregnancy, and at the menopause is accepted. During the premenstrual phase every woman is in a state of pseudo-pregnancy, and one may regard the menstrual flow as a miscarriage of the unfertilized ovum. The enlargement of varices in the premenstrual phase and in the early days of pregnancy may therefore be accounted for by the same hormonal influence."

The work of McLennan[7] on the changes of venous pressure during pregnancy was most thorough and complete. This work was completed at the University of Minnesota while on a fellowship. He checked the antecubital and femoral venous pressures in normal non-pregnant females, normal pregnant women, normal post-partum patients, pregnant women with hypertensive toxemias and gynecologic patients with pelvic tumors. He checked the venous pressures in thirty normal pregnant women and found that the average femoral pressure was 11.43 cm. water pressure while that in the antecubital vein was only 7.88 cm. He also found that the femoral venous pressure tends to rise during the second trimester and through the twentieth to thirtieth week of gestation to a peak of 24 cm. water pressure. He found that it fell quickly postpartum and even below non-pregnant level while the patient was in bed.

It is conceivable that given an inherent weakness of the vein wall the increase in femoral vein pressure in early pregnancy could result in varicosities. This, however, would explain only those cases that had a marked reverse flow of blood from the groin but not at all those cases with a competent valve at the sapheno-femoral junction and yet very extensive varices over the thigh and lower legs. This is often the case. The author prefers to consider it merely as one of the contributing factors. McCausland[4,5,6] working at the Los Angeles Maternity Service, reports on 150 cases. He noticed the

marked relaxation of the uterus, joints and tissues in general during pregnancy. He was one of the first clinicians (1939) to actually try and connect the hormone theory to the development of varicose veins in pregnancy.

It is well known that during early pregnancy there is an increase in the level of the urinary gonadotropins, later to be followed by a greatly increased level of the steroid hormones both in the serum and the urine. Whether or not some alteration in the hormone metabolism in pregnancy particularly the steroids is related to venous physiology is entirely unknown. This report is on the use of sex steroid therapy in the treatment of varicose veins in pregnancy. It is agreed by both obstetricians and those specializing in the treatment of varicose veins that during pregnancy is not the time to institute radical treatment such as the "routine" injection of sclerosing solutions or venous "ligation." Too many instances of almost complete recovery after the pregnancy has terminated contra-indicates this usual non-pregnancy treatment.

In casting about for some way in which to help these patients, McCausland [4,5,6] considered the possibility of sex steroid deficiency in pregnancy. Consequently, he subjected some of his patients to Progynon B. (alpha-estradiol-benzoate) therapy. With 10,000 I.U. hypodermically he thought he observed some improvement in symptoms. When this dosage was made available twice weekly and then increased to 50,000 I.U. weekly, definite improvement was noticed. Marazita [3] treated his cases by the use of estrogenic substance in the form of Di-Ovocylin given parenterally. He reported on the treatment of twenty-seven cases in his series and obtained the best results with larger doses, 50,000 I.U. weekly. In 1946 Aguero (Caracas) reported good results in the treatment of varicose veins in pregnancy by estrogen therapy.

The author became interested in this subject because of his generally poor results in the treatment of varicose veins in pregnancy by both the injection and operative method, though an occasional case responded well to treatment. In most cases the varicose veins seemed to form more rapidly than they could be treated. Following the work of McCausland some good results were obtained with the larger doses of Progynon B (alpha-estrodiol-benzoate) therapy, 25,000 to 50,000 I.U. Because of the economic factor oral therapy was tried. Diethylstilbestrol and Premarin (estrone sulphate) gave good results but the best results from oral medication were obtained from estinyl (estnyl estradiol) tablets 0.05 mg. B.I.D. for the first doses and gradually increased to Q.I.D. The patient may complain of headache and nausea from a sudden large dose given orally. The oral medication should be continued until past the seventh month.

Recently McKenzie [10] has reported spectacular results in the treatment of the relief of varicosities in pregnancy through the use of Estrolutem (estrodiol 20,000 I.U.-Progesterone 10 mg.). His patient experienced nausea with the exhibition of all forms of oral estrogen therapy but with the parenteral type of therapy had almost instant relief.

This presentation covers the care and treatment of 34 cases of varicose veins complicating pregnancy and followed through confinement (Fig. 1). Most patients

Figure 1

Number of Patients Cared for—45

COMPLAINTS	
Pain in labiocele	4 patients
Pain in legs	16 "
Cosmetic	12 "
MONTH WHEN PATIENT WAS FIRST SEEN	
1st month	3 patients
2nd month	6 "
3rd month	12 "
4th month	8 "
5th month	8 "
6th month	8 "

that came direct were seen in the third month while most of those sent by the obstetrician came in the fifth and sixth months. The doctor had recognized the varicosities as complicating the pregnancy only when the patient complained of the pain and distress. Several patients had been told that the varicosities were just one of the things to endure and that nothing could be done to help them. The chief complaint was of pain and a sensation of fullness and pressure in the legs. Four patients complained of pains in the labiocele and a few came for cosmetic effect only. They had little pain or distress.

Following the treatment with the large doses parenterally all patients had relief from the labiocele pain. This usually came within four days following treatment (Fig. 2). Complete relief from the feeling of

Figure 2

RESULTS OF TREATMENT

Complete on 34 cases — no report on 9

Relief of Pain	
Pain in labiocele	4 patients
Pain in legs	14 "
Varicose vein development checked	17 "
No change in development	3 "
Pleased with results	20 "

pressure, fullness and pain in the legs was noticed by 41 per cent of the patients; 50 per cent felt sure that the varicose vein development had been checked. A few cases were sure that they had improved. Fifty-eight per cent of all the cases were pleased with their results, even though many were seen too late to be of much help to them.

All cases of varicose veins complicating pregnancy should wear a supportive bandage of some kind. This should be worn all the time to give the most help. In this series all patients wore the support except for short periods of time now and then.

Conclusions

Varicose veins during pregnancy may become very painful and disabling. They may also entirely disappear postpartum. The telangiectatic or "burst" type of vein seldom disappears after becoming well developed, even with the best of care. Even though the pain can be controlled with the supportive bandage on the lower leg and a tight fitting jock strap for the labiocele, their extensive enlargement will mean more pain and disfigurement when treated later.

The operative treatment of varicose veins during pregnancy is a failure in a high percentage of cases. The injection treatment should be used in only the special cases here and there and for some definite reason.

This report is made with the thought in mind that varicose veins during pregnancy are really complicating that condition and should be looked for and treated by the obstetrician. There is much evidence in favor of the assumption that the rapid development of the varicose veins, in all their forms, is in a large measure due to the presence of a hormone elaborated at times with the pregnancy and circulating in the blood stream.

In almost every case the symptoms directly due to the varicose vein development in itself can be completely relieved, the progress of the varicose vein formation be checked, and the woman assisted through her pregnancy by the judicial use of some ovarian hormone. The best results when considered over all, were obtained by the use of Estinyl tablets 0.05 mg. and the hypodermic use of Progynon B or Estrolutem for those patients with severe nausea.

The author wishes to give credit to the obstetricians cooperating in this effort and in particular to Doctors C. J. Ehrenberg, T. W. Weum and Chas. H. McKenzie, for their kind criticism and suggestions in the preparation of this paper.

The Progynon B. and Estinyl tablets were supplied by the Schering Corporation of Bloomfield, New Jersey, the Estrolutem ampoules by the Lincoln Laboratories of Decatur, Illinois.

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WISCONSIN MEDICAL SCHOOL TO PRESENT INTENSIVE COURSE IN GASTROENTEROLOGY

The University of Wisconsin Medical School through its division of graduate medical education is presenting an intensive five-day course in gastroenterology starting Monday, February 14, and running through Friday, February 18, 1949, according to Dr. Llewellyn R. Cole, Co-ordinator of Graduate Medical Education at the Wisconsin Medical School.

The course will be exceedingly practical and will be under the direct supervision of Dr. K. L. Puestow and Dr. F. L. Weston with the assistance of other members of the medical staff.

The course content will include proctoscopic and gastroscopic demonstrations with discussion of techniques, parasitic diseases of the intestinal tract, food poisoning, toxemias, malignant disease of the tract, X-ray and surgical aspects of therapy, jaundice and its causes, along with other disorders of function and physiology. Enrollment in this course will be limited to twelve physicians and applications may be made out to Dr. Llewellyn R. Cole, the Medical School, 418 North Randall, Madison 6.

J. B. JOHNSTON LECTURESHIP

Dr. Paul C. Bucy, professor of neurology and neurological surgery at the Illinois Neuropsychiartic Institute, will deliver a lecture at the University of Minnesota January 27 at 8 P.M. He will speak in the auditorium of the Minnesota Museum of Natural History.

Dr. Bucy's topic will be "The Cerebral Control of Muscular Activity." The lecture is sponsored by the J. B. Johnston lecture in neurology and is open to all medical men.

Postpartum Hemorrhage

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The last decade has brought a considerable decrease in maternal deaths due to infection and toxemia. Unfortunately, however, there is an apparent lag in improvement in the puerperal death rate from hemorrhage. In 1941 Minnesota recorded 107 maternal deaths (2.0 per 1,000 live births). Of these 18, or 16.8 per cent, were due to hemorrhage. In 1947 the total deaths had dropped to 47 (0.6 per 1,000 live births), but hemorrhage was responsible for 9, or 21.3 per cent. Statistics reveal that approximately one-half of the deaths due to obstetric hemorrhage occur in the postpartum period. Further analysis of these studies indicates that 9 to 15 per cent of all obstetric deaths may be grouped in the category of postpartum hemorrhage. A blood loss of 500 cc., or an amount equal to 1 per cent of the body weight, has been set up as the criteria to define this complication.

The etiologic factors concerned in postpartum hemorrhage may be divided into three main groups:

1. The atonic uterus
2. Mismanagement of the third stage of labor
3. Lacerations of the birth canal

Atonic Uterus

The atonic uterus can usually be anticipated as it is often secondary to prolonged difficult labors, hydramnios, multiple births, placenta previa, and in conjunction with fibromyomata and degenerative changes in the uterine muscle. The alert obstetrician will anticipate abnormal bleeding following labors of this type and will be prepared to deal with hemorrhage and shock in its earliest phases. Evidence indicates that heavy sedation and certain types of inhalation anesthesia predispose the uterus to atony. To those using local, saddle block or caudal anesthesia it is apparent that there is a definite shortening of the third stage of labor, better uterine tone, and a decreased blood loss.

Conduct of the Third Stage of Labor

The second important cause of postpartum hemorrhage is the result of premature attempts to deliver the placenta. This practice is frequently responsible for increased bleeding, and occasionally results in partial or complete inversion of the uterus. Too frequently one has an unconscious desire to remove the placenta by massage or Credé expression immediately after the delivery of the fetus, forgetting that a certain time element must be allowed for its separation. The uterine muscle must regain sufficient tone to contract and separate the placenta from the uterine wall. Cosgrove has aptly stated that the conduct of this stage constitutes the primary responsibility of the obstetrician and that he had better delegate to a subordinate the actual delivery of the baby rather than this important responsibility.

Dieckmann and associates have recently called attention to the statement made by Davis and Boynton in 1941 that the proper management of the third stage of labor begins in the late second stage. They suggest that "for the proper separation of the placenta it is of the utmost importance that the baby be delivered slowly, in stages, with a thirty- to sixty-second pause after the delivery of each shoulder, requiring a total of at least three minutes." They claim that this allows the uterine wall time to contract and retract, thereby tearing itself away from the placenta. When the uterus assumes a globular form the placenta is delivered by compression of the uterus and tension on the cord. They do not believe that an oxytocic drug is necessary for the separation of the placenta, but may be given intravenously after the delivery of the posterior shoulder, if the doctor is experienced; if he is not, then after the delivery of the placenta.

In the presence of analgesic drugs or certain inhalation anesthetics the time necessary for placental separation may be prolonged. Massage or manipulation of the uterus before normal separation has been accomplished merely leads to prolongation of this stage of labor and frequently to unwarranted blood loss. The retention of a partially separated placenta or of individual cotyledons as a result of "manhandling" the corpus of the uterus invites complications which reports and experience prove are too often disastrous. In the majority of instances the best policy is "hands off." Allow time for the contraction of the uterine muscle to separate the placenta and deliver it into the lower uterine segment or into the vagina. If the placenta has not separated in one hour it should be delivered manually, using aseptic technique. At the termination of the third stage a critical and complete examination of the placenta and membranes must be a routine procedure.

Lacerations of the Birth Canal

Deep lacerations of the tissues of the birth canal may be the underlying cause of postpartum hemorrhage. Continued bleeding before or after the delivery of the placenta may be due to tears in the cervix, and these tears may extend well into the lower uterine segment or even into the broad ligaments. Lacerations of the vaginal mucosa, with extension into varicose veins of the vagina and lacerations of the perineal body, may contribute to excessive blood loss. Thus, early recognition and immediate surgical repair of these injuries is important.

Treatment

Although the clinical picture of shock following hemorrhage is readily recognized there has been in the past and there still exists a lack of appreciation of the importance of detecting its early signs and symptoms. To await the development of a cold, clammy skin, pallor,

cyanosis, shallow respirations, marked drop in blood pressure, faint, rapid pulse, and finally unconsciousness, is to invite disaster. A slight drop in the systolic blood pressure or an accelerated pulse in the presence of even moderate bleeding should be a signal to initiate steps to control the bleeding and combat impending shock. Packing of the uterine cavity undoubtedly has some value in the control of bleeding from an atonic uterus, but it is frequently ineffective in the severe cases. Packing of the vagina alone has no value.

The administration of intravenous saline or glucose is of transient value only. Ingraham and Wiggers have demonstrated that a sixth-molar sodium lactate solution in infinitely more valuable in maintaining the alkali reserve and thus delaying the development of irreversible shock. In the management of a sudden massive hemorrhage the rapid administration of adequate amounts of whole blood has no equal, although plasma is a good temporary substitute. Large amounts of plasma should be given to maintain the blood pressure while waiting for blood to be typed and crossmatched. The administration of oxygen also during this time is a valuable procedure. It is well known that increased oxygenation will improve the tone of the uterine muscle, thereby decreasing further blood loss. Frequently large amounts of blood and plasma are required to treat shock due to massive hemorrhage. In one instance the author used 1250 cc. of plasma and 3500 cc. of whole blood when faced with a sudden massive hemorrhage caused by retention of a succenturiate lobe. Hunt has reported eight cases of massive obstetric hemorrhage that necessitated hysterectomy. Some of these patients lost as much as or more than their total blood volume but nevertheless survived their hemorrhage and subsequent hysterectomy because of rapid and adequate blood replacement. The rapidity of this replacement is of prime importance. This may be accomplished by stripping the tubing or by using the pressure mechanisms described by Cole.

Plasma is now readily available to all obstetricians, and may be stored either in its dry or liquid form. It is imperative that liquid or dried plasma be available in all hospitals, and that dried plasma should be an integral part of the obstetric kit for home deliveries.

Categorically, it may be stated that in obstetrics shock is due to loss of blood, and in the treatment of shock there is no substitute for blood. It is hoped that the National Blood Program recently launched by the Red Cross will be successful in making blood available to everybody, everywhere, at any time.

In the Minnesota Maternal Mortality Study (1941-42) a total of 112 deaths were thoroughly analyzed. In the critical analysis of the 10 deaths from postpartum hemorrhage 8 were classified as definitely preventable, 1 as probably preventable, and 1 as possibly preventable.

Case

As an example of a preventable death, the following case report may be cited:

A patient whose labor was initiated by a medical induction was delivered by podalic version after two unsuccessful attempts at forceps delivery of a fetal head in the right occipitoposterior position. Although feeble attempts were made to replace blood loss, the patient died of shock and hemorrhage one hour and fifteen minutes later. Autopsy revealed extensive lacerations of the cervix, vagina and external genitalia, a third degree laceration of the perineum, and hemorrhage into the retroperitoneal tissues of the pelvis. The record states that a vaginal examination made a few minutes prior to delivery revealed a "questionable anterior lip of the cervix." This, coupled with the extensive lacerations of the cervix found at autopsy, would lead one to believe that the cervix was not completely dilated at the time of delivery, and that the patient had not yet entered the second stage of labor. The indications for the radical procedures used in the delivery of this patient are obscure. Apparently the need for replacing the blood loss was not recognized, nor was any attempt made to prevent further blood loss by repair of the lacerations. The fluids administered by vein during the one and one-half hours before death consisted of 200 cc. 10 per cent glucose and 200 cc. of citrated blood. The criticism of the management of this case as related to the cause of death is as follows:

1. Incompetent management of the actual delivery.
2. Inadequate treatment for hemorrhage and shock.
3. Failure to check hemorrhage by repair of lacerations.

Summary

1. Statistics reveal an apparent lag in improvement of the incidence of postpartum hemorrhage as the cause of maternal deaths.

2. Emphasis is placed on the detection of the early signs and symptoms of shock to indicate prompt treatment.

3. Anticipating the development of an atonic uterus will often prevent serious blood loss.

4. Premature attempts to deliver the placenta frequently cause unnecessary bleeding.

5. Rapid and adequate blood replacement are of paramount importance in the presence of massive hemorrhage.

6. Plasma is a good temporary substitute while waiting for blood.

7. Maternal mortality studies indicate that the majority of fatalities resulting from postpartum hemorrhage are preventable.

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Prepartum Care

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During the past twenty-five years wonderful progress has been made in obstetrics. Today the maternal mortality record has approached the figure of 1 per 1,000, that ten years ago was called the irreducible minimum. However, during this time, I feel sure, many large institutions and clinics have bettered this figure. In spite of this low mortality figure, it is my impression that there seems to be an increase in deaths due to toxemias and hemorrhage. The fetal mortality is working well down toward the irreducible minimum. I believe these results come from a lot of hard work and very careful observations by the doctors who are doing obstetrics. If one studies the figures as compiled by our states, he can see what progress has been made.

During the war the birth rate increased at an almost unbelievable rate, and it is still at the nearly all-time high. True, there was a doctor shortage during these same years. However, today the same conditions are not true. During the past twenty-five years there has been a definite effort to educate the public about many of their ailments. Not to be outdone by other branches of medicine, the obstetricians have had their field well publicized too. The public has taken well to this endeavor and, as a result, they are asking for better care than they obtained in years past.

The American people are great migrators, and it is not at all unusual for one to see many new people each year. The Americans are great talkers, and if one has the patience and is a good listener, he can soon learn considerable about many things, including the type and standard of medicine being practiced in most regions of our great United States. It seems to me that during the war years, most doctors were crowded beyond reasonable limits; many short-cuts had to be taken so that a few minutes could be given to each individual seeking care. The people were aware of this, and took it in their stride. Today, they are not nearly as tolerant, at least in our part of the country, and they are only too willing to let us know. They also know the difference between careful and careless medicine. If one doctor doesn't measure up, they will find one who will. Perhaps we haven't had quite enough time to recover from the habits we acquired during the war, but I think sufficient time has elapsed. It seems to me that I have been able to detect some dissatisfaction on the part of the patient because of poor or careless prepartum care, and as the result, I have written this paper. I will outline briefly what I consider adequate prepartum care.

Because of education, the people in our community are seeking care earlier. Most of our patients appear during the first trimester, a few during the second trimester, and only a rare case appears late in pregnancy. This is excellent, and as obstetricians we must do our part to keep abreast of this development.

The first visit is the most time-consuming, but I feel is perhaps the most important. It is at this time that the obstetrician gets to know the patient. We can win her confidence or lose control before it is established. A careful, detailed history must be taken. This should be very meticulous when covering any previous illnesses, especially regarding the heart, kidneys, liver or any metabolic disturbance. Certainly, one should find out about any previous pregnancies and labors. Next, a complete physical examination should be done, which should be as complete and careful as any examination in medicine. Not only are we to determine that the woman is pregnant, but we must know that her body is in such a condition that she can carry the pregnancy and later, that she can deliver a term pregnancy. The obstetrician should have better than just a passing knowledge of medicine in general. If he doesn't have this knowledge, he can't answer the above questions. As a result something important may be missed and the case turn out poorly. A chest x-ray is very useful, and if there is any question of pulmonary pathology, a chest plate should be taken. We have been fortunate in that the mobile x-ray units have recently done a very thorough job in our community, and practically everyone has been screened.

To say that a careful pelvic examination should be done sounds juvenile, but when a multiparous patient says, after a complete prepartum examination has been finished, "Doctor this is the first time I have been thoroughly examined," one is at a loss as to what to reply. A careful speculum examination will reveal any cervical pathology, such as erosions, lacerations, polyps or tumors. Any vaginal infections with yeast, trichomonas, etc., are discovered and can be treated. We get an excellent idea about the condition of the soft tissues and at the same time get a fairly good idea about the capacity of the pelvis. If any gross or suspected deformity is found, the x-ray can be used to give us more definite and accurate information. X-ray pelvimetry has been worked out so that it is now quite accurate, but still can't beat good clinical judgment in all cases. I believe that it should be reserved for those doubtful problems and not used as a routine for all obstetrical cases, as it is too expensive to use routinely in private practice.

The urine should be examined; a hemoglobin, red cell and white cell count, blood serology, Rh factor and blood typing should be done on the first visit. With all this information at hand one is now able to honestly and intelligently start to take care of the prepartum patient.

I have found that much time can be saved in the future care of a case if I assume nothing, and unless I have recently confined the patient, talk to her as if this is her first experience with pregnancy. She is told what to expect during the following month. This is gone

over in detail, which really only takes a few minutes, and usually relieves any apprehension she may have. Unless a patient is overweight I do not put her on any strict dietary regime. She is simply asked to follow a well rounded diet including meat, eggs, dairy products, vegetables and fruits, and to go easy on the intake of bread and desserts. I suggest that she try to hold her weight gain to about two to three pounds per month. The majority of the patients will follow this and do very well. There does seem to be one group of people who just gain weight in spite of what anyone does. I have found that it does not help to fuss at them as this only serves to make them dread their following visits. As a result a good deal of the doctor-patient contact is lost. I firmly believe that the prepartum visit should be a pleasant one for both the doctor and the patient.

During each subsequent visit the patient is weighed, her blood pressure taken, and when necessary, any further laboratory work ordered. Then, in a friendly chat I tell her, in detail, what changes will take place in the coming month. This certainly answers most of the questions before they arise and the patient gains considerable confidence in her doctor. Maybe, for want of a term, one may call this the psychiatry of the prepartum period. I firmly believe it is a very important part of the prepartum care. The patient certainly tolerates a great many of the little annoying discomforts much more readily, and with very little or no fuss. She is better prepared for the onset of labor and usually will be a calm and collected person who has a good idea about what is going to take place. The result, I believe, is a person quite relaxed, who often requires considerably less sedation during her labor. Consequently, the experience is made easier for all concerned.

With the recent increased knowledge about the Rh factor, today we can save some children who would otherwise have been lost a few years ago. Whenever one finds a setup that is right to produce an Rh baby with the dreaded erythroblastosis fetalis, we should be on the lookout anytime after the 28th to 30th week of the gestation. A very simple test can be run on the mother's blood to determine the Rh antibody titre. This should be checked frequently from this time on, and when the titre begins to show, one must do something to bring about delivery before the baby gets into serious difficulties. I am well aware that it is by no means established that the rise in antibody titre is a definitive measure that labor must be induced, but to date it is the best test yet devised. True enough, we often get a premature infant, but if left to the forces of nature, the result would be a dead fetus.

Similarly, with the recent development in measuring the pelvis by x-ray we can prevent most of the emergency cesarean sections. Near term, when one suspects any type of pelvic disproportion, x-ray pelvimetry by a competent roentgenologist is of untold value in many of these cases, particularly with the deformed inlet and the serious mid-plane contractures. Intelligent interpretation of these findings will allow us to do the sections by choice and unhurriedly. The results are invariably better.

Prepartum visits should be at increasingly shorter intervals during the last trimester when we are on the lookout for any developing toxemia. Careful attention to excessive weight gain, increasing blood pressure, edema and albuminuria should give us an excellent idea as to what is happening. We must not ignore these signs of beginning toxemia and should institute intelligent and positive treatment as is deemed necessary.

One of the members of the Minnesota Society is doing a very intensive investigation in this field. He is attempting to find the cause and to detect the onset of toxemia by serologic means. I am sure we all hope that he succeeds in solving this age-old problem.

In our obstetrical practice at the Grand Forks Clinic, the incidence of toxemia is 4.6 per cent in our last 1,624 consecutive cases. It is my impression that, of late, there is an apparent increase of this complication.

With this apparent increase in the late toxemias, the stubborn fact remains that the cause is not known. Therefore, careful clinical observation of the triad, hypertension, albuminuria, and weight gain, still is our first line of defense. In other words, we must be on our toes all of the time so as to achieve even better results than we have today.

E. STARR JUDD LECTURE

The sixteenth E. Starr Judd Lecture will be given by Dr. Alton Ochsner, William Henderson Professor of Surgery at the Tulane University, New Orleans, Louisiana, Tuesday evening, January 18, 1949, at 8:15 in the Auditorium of the Museum of Natural History, University of Minnesota. Doctor Ochsner's subject is "The Treatment of Postphlebitic Sequelae by Vasodilatation and Other Measures."

The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in Surgery a few years before his death.

The Management of Neglected Transverse Presentation by Waters Extraperitoneal Cesarean Section

Report of Two Cases

C. W. Seibert, M.D.
Waterloo, Iowa

The following two cases are presented to illustrate the use of the Waters extraperitoneal cesarean section in actually or potentially infected cases occurring in young women in whom the termination of further child-bearing by the Porro operation is undesirable.

Report of Case No. 1

Mrs. L. D., age 21, Gr. 1, whose E.D.C. was April 21, 1947, was first seen in the hospital of a neighboring town at 11:00 P.M. April 10, 1947. The membranes had ruptured spontaneously at 3:30 P.M. April 8, 1947, a large amount of fluid escaping. Pains had begun at 6:00 P.M. of April 10, 1947, shortly after which the malpresentation was discovered and consultation called.

General physical examination was entirely negative. Blood pressure was 120/80, urine negative and R.B.C. 4,630,000; W.B.C. was 21,150 and Hb 14.35 Grams. Pelvic measurements were within normal limits. The temperature was 98.8 and pulse was 90.

Examination of the abdomen revealed the fetus to be near term in right acromium posterior presentation, the right shoulder being deeply impacted in the pelvis. The fetal heart was clearly heard in the midline. X-ray examination of the abdomen verified these findings.

Under ether anesthesia, a sterile vaginal examination was carried out which revealed the cervix to be 2 centimeters dilated, thick, and very little effaced. The previous impression of deep impaction of the presenting part was verified. Because of the above findings, it was felt that delivery by Waters extraperitoneal cesarean section would serve the best interests of both mother and child. The patient was therefore moved by ambulance to Allen Memorial Hospital in Waterloo, arriving at 1:05 A.M. April 11, 1947. Under spinal anesthesia a 7 lb. 6½ oz. female infant was delivered at 3:15 A.M. by Waters extraperitoneal section. The infant was delivered through the uterine incision by version and extraction without extension of the incision or tearing into the peritoneum. The baby cried immediately and was in good condition.

The mother's postoperative course was entirely uneventful, the highest temperature being 100.2 degrees on the first postoperative day. The Foley catheter was removed in eighteen hours and the patient voided spontaneously without residual. She was allowed out of bed at will after the first twenty-four hours. The wound healed by primary union. The patient received penicillin for forty-eight hours postoperatively. Mother and baby were discharged the ninth postoperative day in good condition.

Case No. 2

Mrs. R. B., age 27, Para 1, Gr. 11, E.D.C. July 10, 1947, was admitted to Allen Memorial Hospital at 6:40 P.M. on July 6, 1947, following telephone consultation with her physician in a neighboring town. Active labor had begun at 11:00 A.M. on July 5, 1947, and had progressed slowly. The membranes had ruptured spontaneously at 4:30 A.M. July 6, 1947, followed by hard pains every three to four minutes. At 4:00 P.M., July 6, 1947, a transverse presentation with prolapse of a hand and arm of the fetus into the vagina was discovered.

General physical examination of the patient was negative. The blood pressure was 110/60, R.B.C. 4,200,000, W.B.C. 15,000 and Hb. 13.15 gm. The temperature was 98.4 and the pulse was 84. Examination of the abdomen revealed a term pregnancy with the fetus presenting in the transverse, the head being markedly hyperextended in the right iliac fossa, the back being anteriorly. The fetal heart was clearly heard in the right lower quadrant. Rectal examination revealed the cervix to be approximately 4 centimeters dilated with the left shoulder impacted in the pelvis, the left hand and arm being prolapsed into the vagina. The lower uterine segment was extremely tender to palpation and it was the impression of the examiner that it was unusually thin. X-ray examination verified the fetal position. After due consideration it was decided to deliver this patient by cesarean section and in view of the thirty-six hours of labor and ruptured membranes for sixteen hours, the extraperitoneal route was chosen.

Under spinal anesthesia a 7 lb. 10 oz. female infant was delivered at 9:45 P.M. by Waters extraperitoneal section. The infant was delivered from the uterus with moderate difficulty, by version and extraction but the incision did not extend nor was the peritoneum opened. Upon exposing the lower uterine segment it was found to be almost paper thin, and certainly would have tolerated little stress without rupture. The infant cried immediately, and was in good condition, but held the head in marked hyperextension for thirty-six hours or more after birth. The prolapsed arm and hand were edematous and cyanotic at birth but this disappeared spontaneously in a period of a few hours.

The patient had an uneventful postoperative course, the highest temperature being 99 on the first and second

postoperative days. The Foley catheter was removed in eighteen hours, and she voided spontaneously without residual. Penicillin was given for forty-eight hours postoperatively. She was allowed up freely within twenty-four hours of delivery. The wound healed by primary union. Both mother and baby were discharged in good condition on the ninth postoperative day.

The question of low cervical, versus extraperitoneal approach in the actually or potentially infected case is one that is now being considered frequently in obstetric literature. Many now feel that with the use of the new antibiotics and more wide-spread availability of blood, the scope of the low cervical transperitoneal operation may be extended. However, it may well be argued that these measures are just as efficient in the patient who has been delivered by the extraperitoneal route plus the added advantage of complete lack of peritoneal spill.

Certainly the need for the extraperitoneal operation will not arise frequently, but I do feel that it will find a place in the armamentarium of the obstetric surgeon.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, INC.

A number of changes in Board requirements and regulations were made at the annual meeting of the Board held in Washington, D. C., May 16 to May 22, 1948. New Bulletins are now available for distribution upon application and give full details of all new regulations. These relate both to candidates, and to hospitals conducting residency services for training.

Foremost are the following:

1. The ruling that applicants must receive adequate training in both obstetrics and gynecology has been defined as meaning a minimum of six months, full-time, in the branch of either obstetrics or gynecology relegated to a minor role in a candidate's training and preference for practice.

2. Acceptable preceptorship training is defined.

3. The present regulation requiring at least six months of practice in the specialty following the completion of an acceptable training period, has now been extended, effective December 31, 1949, to a requirement of two years post-training practice limited to the specialty.

4. Specific requirement for approval of hospital services for residency training are outlined.

5. Effective immediately, there will be no further temporary approvals of hospital services for residency training. It is planned that all hospitals holding any type of residency training approval will soon either be resurveyed or initially surveyed by the Council on Medical Education and Hospitals of the A.M.A. so that all future approvals, new or old, will be based entirely upon inspection following application. It is expected also that certain resurveys will result in withdrawal of present residency approval from institutions where the educational and training standards are not being maintained.

The next scheduled examination (Part I), written examination and review of case histories, for all candidates will be held in various cities of the United States and Canada on Friday, February 4, 1949.

Puerperal Sepsis

A Case Report

Joseph F. Bicek, M.D.
St. Paul, Minnesota

The original intention was to present a paper on the Newer Aspects of the Management of Puerperal Sepsis, covering briefly the history, course, clinical considerations, and dwelling mainly on the modern treatment. However, due to the long program, and the much needed time, it was decided to only present a case report on Sepsis. Today we have many controversial problems, viz.: Should we treat carcinoma of the cervix only by irradiation, or should we utilize only surgery, or a combination of both? Should we remove the whole adnexa in a case of ectopic pregnancy, or save a good ovary? What is the best analgesia in labor, by chemotherapy, or by spinal, or by local infiltration? There are a score of other debatable procedures too numerous to mention, but one thing is a certain non-debatable fact, and that is the possibility of infection in the puerperal state. Puerperal infection whether it is autogenous or heterogenous, endogenous, or exogenous still does exist, and in spite of such excellent chemotherapy and antibiosis that we have at the present time, still is a dreaded malady, and still is highly dangerous. Nothing in this presentation is going to be claimed to be spectacular, absolutely innovating, or brilliantly original, but a brief case report will be given to bring back to our minds that there still exists a condition known as puerperal sepsis.

Mrs. D. M., age 25, gravida IV, para II, was admitted to St. Luke's hospital in St. Paul at 2:07 P.M. on March 3, 1948, in labor. She delivered without any difficulty at 4:35 P.M.; she had one dose of Demerol and Scopalamine only. There were no tears. The infant weighed only 6 lbs. 4 oz., and unfortunately had a double harelip and cleft palate. This was not too enthusing but unfortunately was not to be the last. Intravenous ergotrate was not used when the head was being delivered, but after about ten minutes an unsuccessful attempt was made to express the placenta. Many more attempts were made, but the placenta did not deliver for a period of 40 minutes. At the end of this time the patient was thoroughly anesthetized and using sterile technique the vaginal tract was entered to try to determine the cause and if possible to extract the placenta.

The cervix was partially closed up and the cord was followed up, but the placenta was not lodged in the lower uterine segment, as is frequently the case. Careful entering of the whole hand revealed the placenta to be up in the uterus, over the fundal and the anterior surface. It apparently had made no attempts to separate and likewise would not peel off. When grasped and pulled, the uterus came down as one piece. Peeling detached only small pieces, and luckily no bleeding was encountered. After about six minutes of trial at the end of which the whole hand was almost paralyzed by the contraction of the uterus, in spite of the anesthesia the hand was withdrawn along with small pieces of placenta that were loosened. Still there was no bleeding. After some deliberation, again the vaginal tract was entered with a fresh sterile long glove, and the same results were achieved as the first time. There still was no bleeding. Less than one-half of the placenta was removed. A definite diagnosis of Placenta Accreta was made.

The patient was given pitocin, and intravenous ergotrate and put to bed. She was given plasma and saline. Ergotrate was ordered by mouth, every four hours. Penicillin, 50,000 units every four hours, was started intramuscularly. Hemoglobin estimation on March 5, 1948, was 9.8 gm. Sahli. On March 5, also, she expelled a large blood clot which showed a small amount of decidual tissue. On March 6, the lochial flow was normal in amount. Because of the anomaly in the baby she could not nurse, so she did require stilbestrol for drying up the breasts, and also occasional pain relief. Penicillin was continued throughout March 8. On March 10, she passed a very small clot, and a very few small ones on March 12th. She felt very good, and was left to walk on March 10th. There was no temperature following the delivery except on March 13th, she registered 100.2 at 8:00 P.M. Otherwise 99.2 was the highest it ever reached during the nine day stay. Due to her financial state she could not afford to stay any longer, and it was with reluctance that she was discharged at 2:00 P.M. on March 14th. She was given strict instructions to come back immediately if cramps and bleeding appeared. She did not disappoint us for too long. On March 15th, at 3:30 P.M., at her home, she started to bleed. Instead of calling an ambulance to go back to the hospital, a neighbor got excited and summoned the emergency squad car. Unfortunately, the police surgeon not knowing the case, did not save what the patient had passed, which by history was quite a lot, and therefore we had nothing to go by when she was readmitted at 6:45 P.M. on the same day. She was quite exsanguinated, and on admission had a temperature of 98.8. Hemoglobin on admission was 8.8 gm. Sahli. The very next day the temperature rose to 104.6 and from there on she ran a sawtooth septic temperature continually until March 23rd, from which point it slowly tapered off to normal. Her condition on the readmission appeared quite bad. The hemoglobin was 8.8 gms. and dropped quickly to 7.7 gms. the next day. She was immediately given 500 cc. of plasma and two hours later when a donor was obtained, 500 cc. of whole blood. Fortunately on admission she was not bleeding. On March 16th she was given 500 cc. of blood again and also one-half gram of sodium sulfathiazole intravenously. This was repeated on March 17th and also on March 18th. On March 18th penicillin at the rate of 50,000 units every four hours was started. On

March 19th penicillin was continued and in addition .2 gm. of streptomycin was started about every five hours. Both penicillin and streptomycin were continued throughout March 27th. On March 22nd 500 cc. of blood was given. In all, the patient received 2,000 cc. of blood and 500 cc. of plasma. Throughout her septic course the patient was quite sick, had occasional chills, and required pain relief mainly because of leg pains. There never was any evidence of thrombophlebitis. Calcium intravenously relieved most of the pains. No dicumerol was used at any time because of the fear of bleeding. Also as long as no bleeding was encountered, no pelvic examinations were made. Not until the second of April with a normal temperature existing for about three days, did I attempt a cautious bimanual and found an involuting uterus which was not out of proportion to the postpartum time. The complication that this patient did definitely develop was rheumatic pain in the right shoulder and left ankle. No bleeding followed the bimanual, her temperature was normal; patient walked around, felt good and therefore was discharged on April 3rd. Further follow-up showed the uterus to be involuting normally. At the present time she is perfectly well, having a normal menstrual cycle and showing no adnexal indurations in the pelvis anywhere.

This case presents many angles. There is little doubt as to the diagnosis of Placenta Accreta. A few procedures might be questioned. Ergotrate was not used intravenously when the head was being delivered; however, that probably would not have altered the adherence of the placenta and facilitated expulsion. Trying to extract the placenta manually is contradictory to the modern concept, which is to leave the patient alone and watch and wait, but where trained observance and quick necessary action is highly essential, which was not to be had in this case, a careful attempt at manual removal is indicated. One entry and out under the most sterile conditions should be the rule. Apparently in this case the villous attachement into the muscle finally detached after the fetal circulation ceased. This, however, does not always happen and in Placenta Accreta, the doctor may often have to resort to uterine packing first, with ultimate hysterectomy. In this case there was no sepsis for nine days. Under direct control no evidence of infection was present. What happened when the patient left the hospital is unknown. When the patient was readmitted after apparently expelling the placenta at home, she immediately showed signs of sepsis. Was it Sapremia? The real organism was never determined but streptococcus was most likely.

A brief summary and comments on the new and modern method of management of sepsis are noted here:

1. A careful prenatal study will cut down the possibility of infection, be it autogenous or heterogenous.
2. During labor extreme asepsis should be employed and intravaginal manipulation reduced. Unnecessary vaginal entries should be avoided and necessary ones must be done under extreme caution.
3. In suspected contaminations, use sulfonamides and penicillin prophylactically.
4. In definite sepsis it is essential to resort to sulfonamides, paying attention to urinary excretion and maintaining blood levels up to 15 mgm. per 100 cc. if possible and if tolerated. All the organisms will not be hit, but certainly the most dangerous, the streptococcus. Penicillin in large doses should be started concomitantly. If no appreciable alleviation, immediately start streptomycin. About .2 gm. every four hours is sufficient. There is no doubt that the advent of chemotherapy and antibiosis has revolutionized our treatment of sepsis.
5. Blood by transfusion should not be spared.
6. Where bleeding is not a factor, controlled dicumerol therapy to prevent deleterious thrombophlebitis should be used. Recent results show heparin to be even more desirable.

As a final statement this author believes that radical and effective treatment will certainly cut down the number of puerperal sepsis cases that eventually have to come to surgery.

CONTINUATION COURSES

The University of Minnesota announces a continuation course in Cardiovascular Diseases to be given at the Center for Continuation Study on February 14 and 15, 1949. The course is intended for general physicians and is sponsored by the Minnesota Heart Association.

The University is also offering a continuation course in Pediatrics to be given at the Center for Continuation Study on February 7, 8, and 9, 1949. The course is intended for general physicians and is sponsored by the Minnesota Department of Health.

Basal Temperature Records in Obstetrics and Gynecology

Melvin B. Sinykin, M.D.
Minneapolis, Minnesota

The normal fluctuation of basal body temperature in the human female produces a biphasic curve during the menstrual cycle. Although this curve is subject to variation between individuals and to a lesser extent from cycle to cycle in the same individual, the general pattern is sufficiently characteristic to have aroused interest and study by numerous investigators during the past century.[1] The interpretation of this pattern had to await the development of knowledge concerning ovarian function in relation to the menstrual cycle. As early as 1905 Van de Velde related the occurrence of mittelschmerz and ovulation to the low point of the basal temperature curve.[1]

The biphasic curve of the basal temperature record in the normal menstrual cycle has been shown to be closely related to ovarian hormone production. Cyclic therapy with estrogen followed by progestin in women who are amenorrheic as a result of ovarian failure or surgical castration reproduces the biphasic curve.[2,3,4] Chorionic gonadotropin administered in large dosage during the luteal phase will cause the prolongation of the postovulatory temperature rise probably by stimulating luteinization and thereby continued progestin secretion. When chorionic gonadotropin is administered to ovariectomized women who have been primed with estrogen, no temperature rise occurs since there is no ovarian tissue to be stimulated.[3]

The basal temperature is obtained by the patient before she arises each morning. Rectal temperatures were favored in the past for this purpose but the oral temperature has been shown to be equally reliable. The patient must be carefully instructed in the technic of taking her temperature and she must be warned against late retiring, alcoholic excesses, and emotional upsets. The temperature may be recorded on ordinary graph paper or on specially prepared graphs. If the patient cannot be relied upon to keep the graph she may be instructed to write down the temperature, the date, and other pertinent data each morning. The graph can then be quickly drawn at the time of her office visit. The reliability of the completed record depends upon adequate instruction, cooperation by the patient, and the absence of such disturbing factors as infection, emotional disturbances, and alcoholic hangovers. According to Davis and Fugo,[2] who have reviewed 1,000 temperature graphs, about 75 per cent of patients present graphs which are sufficiently typical to provide valid data concerning ovarian function.

During the normal cycle the temperature remains low during menstruation and the preovulatory period. A rise in temperature then occurs, usually over a period of one to three days and usually from 0.6 to 0.8 degrees F. The elevation is then maintained in the form of a plateau for about 14 days and drops just before or at the time of onset of the next menstrual period. If pregnancy occurs the temperature is maintained until mid-pregnancy when it gradually drops to preovulatory levels. A drop in temperature just before the rise has been considered typical by some observers. However, this drop is not constant and is not a reliable indicator that the shift in temperature is about to follow.[2]

To evaluate the reliability of the basal temperature record, a series of 50 cycles from 15 patients were analyzed. The temperatures were taken orally before arising and after holding the thermometer in the mouth for at least four minutes. A smaller rise in temperature preceding the main rise occurred in 14 cycles or 28 per cent. A drop in temperature before the shift was found in 13 or 26 per cent of the cycles. The duration of the temperature rise was one day in 15 cycles, two days in 9, and three days in 11. The remaining cycles showed a duration of rise varying from four to seven days. Thus the temperature rise in 35 or 70 per cent of cycles was of one to three day duration. The amount of the temperature rise varied from 0.4 degrees F. to 1.2 degrees F. In most cycles the rise fell into a range of 0.6 to 0.8 degrees F. The duration of the temperature elevation preceding menstruation was 12 to 15 days in 78 per cent of the cycles. In no case was the duration greater than 15 days although in the remaining cycles the duration of temperature elevation was as short as nine to eleven days. In general these figures agree with previously reported estimates that 75 per cent of the basal temperature records are characteristic enough to be of value.

A close relationship between the time of ovulation and the temperature shift has been determined by numerous studies utilizing other signs of ovulation such as the vaginal smear,[5] increase in the quantity of cervical mucus,[6] endometrial biopsies,[7] and known dates of conception.[8,9] The most direct evidence has been produced by Greulich [10] who performed laparotomy at the time of the temperature rise and determined the gross and histological appearance of the ovaries in about 70 patients. His observations indicate that ovulation occurs during the temperature rise. A dissenting opinion in this regard is that of Farris[11] who reports the known dates of conception of 27 women who kept basal temperature records and in whom the probable date of ovulation was determined by the rat ovulation test. He found that 41 per cent of the conceptions took place before the temperature change, 37 per cent during the rise, 15 per cent during the low point and 7 per cent after the rise.

Despite its limitations, the basal temperature record (hereafter designated as BTR) is proving to be a sim-

ple, economical, and useful aid in the practice of obstetrics and gynecology. Although the widest application of this method has been found in sterility study, it is equally valuable for other conditions. Some examples of the use of the BTR in practice are presented to illustrate the diversity of its application.

Use of BTR in patients with menstrual abnormalities: Fig. 1 illustrates the appearance of the BTR in

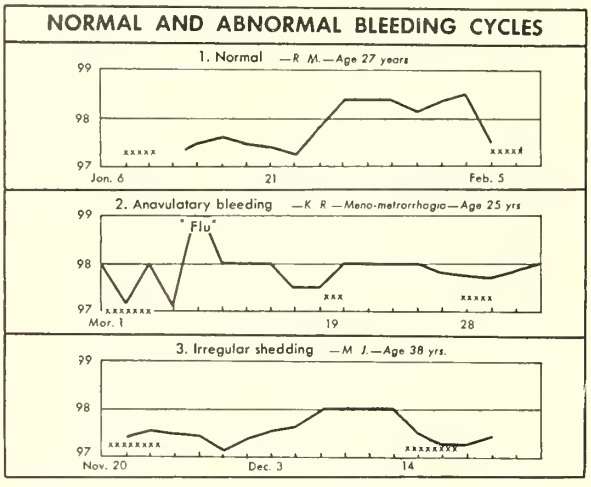


Fig. 1.

normal and abnormal menstrual conditions. Case 1 is a good example of the typical normal curve. Case 2, K. R., is a 25 year old patient with irregular and profuse periods of uterine bleeding. The BTR reveals a monophasic curve indicating failure of ovulation. Case 3, M. J., age 38 years, complained of prolonged and profuse menstrual periods. Diagnostic curettage performed at the University of Minnesota Hospital two years previously revealed irregular shedding of the endometrium. The menorrhagia persisted and she was sent to a special study clinic in the outpatient department where she was instructed in the use of the BTR. This revealed a persistence of the temperature elevation into the menstrual period. Since the delayed temperature drop suggests delay in the regression of the corpus luteum, this finding is in agreement with the observations of McKelvey and Samuels [12] that the excretion of sodium pregnandiol glucuronidate persists into the early menstrual period in irregular shedding. Nieburgs [13] also reported that in menorrhagia the basal temperature does not fall as it normally does in the premenstrual period but remains at a high level until the end of the menstrual phase. The BTR is being used in the irregular shedding clinic as a guide to timing experimental hormonal therapy to the late premenstrual period.

Use of BTR in infertility: The greatest value of the BTR to the infertile couple obtains when the menstrual cycles are irregular and the time of ovulation is therefore variable in relation to the time of the preceding period. The value in using the BTR is dependent on the ability of the patient to recognize the time of temperature shift and to utilize that period of time for attempt

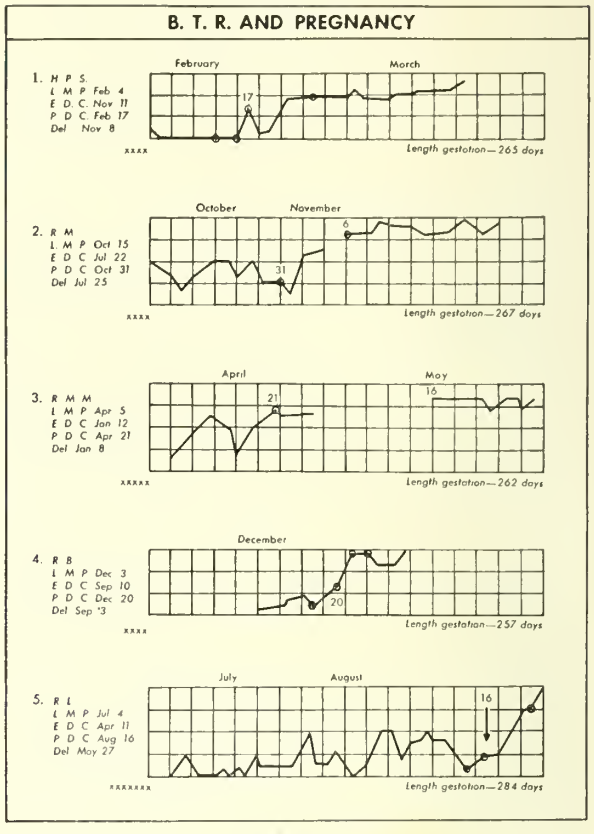


Fig. 2.

at conception. Fig. 2 shows the temperature records of five patients who achieved pregnancy. In each instance, except in Case 2, coitus occurred at the time of the temperature rise. In Case 2 the probable date of conception occurred twenty-four hours previous to the time of temperature rise. Case 5 illustrates an unusually long interval between the preceding menstrual period and the time of conception. According to the date of her last menstrual period R. L. would be given an estimated date of confinement as April 11. From the probable date of conception this was revised to May 8, and delivery occurred May 27 after a total period of gestation of 284 days. The usually accepted figure for the average interval between ovulation and delivery is 266 days. It is interesting to note that the average length of gestation of the five patients in Fig. 2 is 267 days.

Fig. 3 shows the BTR of R. L. carried through the entire period of pregnancy. The temperature is maintained at its postovulatory level through the fifth calendar month and then gradually drops to pre-ovulatory levels. Buxton and Atkinson [3] have reported four complete pregnancy records and Dr. Charles McKenzie [14] has obtained the complete BTR of two pregnancies. In all of the pregnancy records the general pattern is the same. The temperature level is maintained until the fourth or fifth month and then gradually drops. Since progestin has been found to elevate the basal temperature and since pregnandiol excretion studies reveal a gradually rising level during the last trimester of preg-

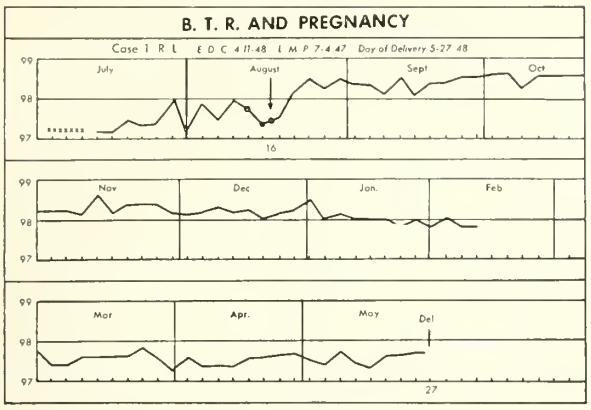


Fig. 3.

nancy, one would expect a gradually rising temperature at this time. The reason for the discrepancy is not clear.

Use of the BTR as an aid to the rhythm method of contraception: The BTR is useful as an aid to the rhythm method during lactation and when menstrual cycles are irregular in length. Fig. 4 illustrates such use

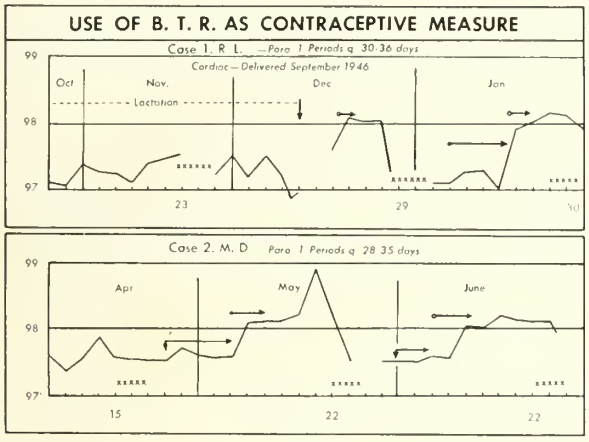


Fig. 4.

of BTR by two patients. R. L. is a patient with mitral heart disease who for religious reasons is unable to use mechanical methods of control. During lactation she was asked to abstain from marital relations unless a typical temperature rise occurred and was maintained for five days. During lactation she had an anovulatory bleeding period. Following cessation of lactation she ovulated and after five days of temperature elevation intercourse was permitted. The arrows indicate the periods of abstinence. Following menstruation she was directed to abstain after the eleventh day of her cycle and not to resume marital relations until the temperature rise had been maintained for five days. These figures were arrived at as follows: Since by history her cycles varied from 30 to 36 days, the earliest probable date of ovulation would be 30 minus 14 or day 16 of the cycle. To allow for variation in the time of ovulation and for the probable life span of the sperm an additional five days are subtracted thus arriving at the figure 11 for the cycle day at which abstinence starts. Following the temperature rise an additional five days of abstinence allow for the life span of the ovum and sperm and for errors in the interpretation of the BTR.

The advantage in the use of BTR as an aid to the rhythm method lies in the increased length of the safe period afforded in the postovulatory part of the cycle. Case 2, M. D., has mentrual cycles varying from 28 to 35 days in length. During a 28 day cycle her safe period following ovulation would be nine days with the use of the B.T.R. and only two days using the mathematical calculations of the rhythm method. If her cycle were 35 days the safe period would be the same with either method.

Use of the BTR as an early pregnancy test: The life span of the corpus luteum and likewise the duration of the postovulatory temperature elevation is rarely longer than fifteen days in the absence of pregnancy. Therefore when the temperature elevation persists for 20 days and the pattern of the BTR is biphasic, the diagnosis of pregnancy may be made with considerable assurance. At this time, less than one week after the missed menstrual period, palpatory findings and the usual biological pregnancy tests are not reliable. The diagnosis of pregnancy at this early stage in the patient with evidence of predisposition to abortion may be of considerable value since prophylactic steroid hormone therapy can be started within one week of the missed menstrual period. Fig. 5 illustrates the use of BTR in two such cases.

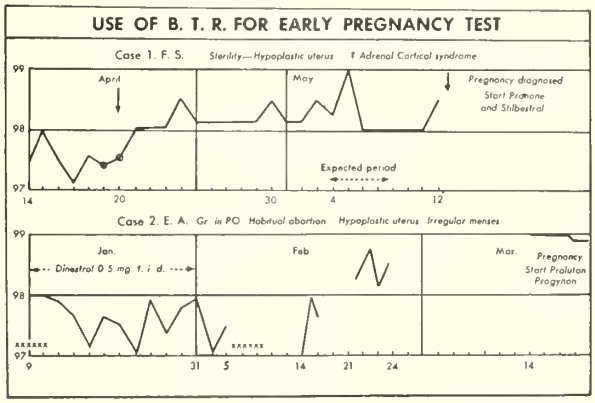


Fig. 5.

F. S., age 28 years, gave a history of irregular menstrual periods occurring at intervals of two to nine months since their onset. She was told three years previously that her uterus was infantile and she was given a series of hormone injections to develop the uterus. On examination she presented a masculine type of body build, generalized hirsutism of moderate degree, enlarged clitoris, small conical cervix, and a definitely hypoplastic uterus. Vaginal smear revealed many castrate cells. She was given directions for keeping the BTR and was asked to return in one month. At the time of the next office visit her BTR was reviewed and pregnancy of about 22 days duration was diagnosed. Steroid therapy was started immediately because of the small size of her

uterus. She carried her pregnancy uneventfully except for an episode of spotting during the second month.

E. A., age 26 years, first appeared in June 1946 for treatment of sterility of 4½ years duration. Her history revealed irregular menses occurring in cycles of three to eleven weeks. Examination revealed a hypoplastic uterus. B.M.R. was minus 25 per cent. After thyroid therapy she became pregnant in September 1946 but aborted at five weeks gestation. She again conceived in April 1947 and aborted at eight weeks gestation. The uterus remained small and her menstrual period irregular. In January 1948 cyclic therapy with stilbestrol was started in an attempt to develop the size of the uterus. She was unable to tolerate the drug so dinestrol was substituted. The BTR shows an anovulatory bleeding period in January 1948. Dinestrol was stopped in February 1948. On March 14 she phoned that she suspected pregnancy because of nausea and breast soreness. She was asked to resume keeping her BTR and report in one week. Although the BTR was incomplete, pregnancy was considered very probable. Prophylactic steroid hormone therapy was started and continued during the first four months of pregnancy. Despite recurrent episodes of uterine cramps she carried her pregnancy until three weeks before term.

Other uses of the BTR: The diagnosis of obscure pelvic pain may be aided by use of BTR. This is illustrated by the case of R.A., age 36 years who five years previously had a pelvic laparotomy at which time subtotal hysterectomy and left salpingo-ovarectomy was performed for myoma of the uterus and cystic left ovary. Since the time of surgery she has complained of intermittent right lower abdominal pain. On bimanual examination the right ovary was felt to be normal in size but fixed to the cervical stump and to the lateral pelvic wall. She was asked to keep a BTR and mark the days when pain occurred and to grade the pain from one to four. Examination of the record at monthly intervals revealed a biphasic type of curve with the time of pain mostly in the follicular or preovulatory phase. The intensity of the pain was greatest just preceding the temperature shift. From the BTR it seems likely that the pain is a form of mittelschmerz possibly related to the fixation of the ovary by postoperative adhesions.

The BTR has also been used to determine the effect of estrogen therapy on ovulation in the treatment of dysmenorrhea. Estrogen given in adequate dosage starting early in the menstrual cycle will inhibit ovulation. The resulting anovulatory bleeding period is almost always painless. The BTR can be used to verify the inhibition of ovulation. If the patient complains of midline crampy pain during an anovulatory bleeding period the cause of the pain is probably psychic.

Conclusions and Summary

1. Abundant evidence exists that indicates a close relationship between the biphasic basal temperature curve and hormonal changes incident to the process of ovulation and corpus luteum formation.

2. The interpretation of the BTR as a reflection of ovarian function is valid in the majority of patients. Difficulties may be due to poor cooperation of the patient, occurrence of infection, and individual variation in the duration and the amount of temperature shift.

3. Analysis of variations in the BTR kept for 50 cycles by 15 patients is presented. Temperature rise preliminary to the main temperature shift was found in 28 per cent of cycles. Temperature drop just before the rise was present in 26 per cent. The duration of the temperature shift was found to fall within a three day range or less in 70 per cent and the degree of shift was from 0.6 degrees F. to 0.8 degrees F. in the majority of cycles.

4. Examples are presented of the practical value of the BTR in menstrual abnormalities, in infertility, as an aid to rhythm contraception, as an early pregnancy test, for estimating the date of confinement and for determining the relation of obscure pelvic pain to the ovarian cycle.

5. The BTR during pregnancy is characterized by persistence of the postovulatory temperature elevation until the fifth month when it gradually drops until delivery. The pregnancy pattern of the BTR cannot be explained by the known hormone levels during pregnancy.

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Peritoneal Irrigation in Treatment of Severe Oliguria Caused by Transfusion Reaction

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This discussion is concerned with the experiences gleaned from the management of one case of severe hemolytic transfusion reaction and is in no way to be construed as applicable to all cases of temporary renal insufficiency arising from such reactions.

This particular case is being presented because it again serves to re-emphasize the extreme importance of the Rh factor in transfusion therapy, and because it involves several rather major and specific therapeutic procedures. Further, it affords the opportunity of adding to a sparse literature on the subject, another successful application of peritoneal lavage in the treatment of renal insufficiency. No attempt will be made to discuss the many intricate metabolic, biophysical and technical problems involved in the use of the peritoneum as a dialyzing membrane. This is merely a summation of the pertinent data in chronological sequence pertaining to this particular case.

Case Report

The patient, Mrs. A. E., age 40, was admitted to the Minneapolis General Hospital on April 15, 1948, with the complaint of a heavy dragging sensation in the pelvic region with stress incontinence. Omitting the details the patient was in generally good physical condition with the exception of a pronounced anterior and posterior vaginal wall relaxation. Her weight was 186 lbs., and cardiac examination including an electrocardiograph was normal. Her blood pressure was 140/100.

The hemoglobin was 85 per cent (Sahli) and the blood group was O, Rh positive. Her blood was cross-matched with group O, Rh positive blood. The blood urea nitrogen was 20 mgms. per cent. Catheterized urine specimen was normal. Careful medical work-up revealed nothing unusual. Observation cystoscopy and ureteroscopy was done on April 16, 1948. On the morning of April 19, 1948, a combined vaginal plastic procedure and a pelvic laparotomy were performed. Although there was at no time excessive bleeding the patient sustained a drop in blood pressure to 96/60. Consequently, during the course of the surgical procedure she was transfused with one liter of whole blood. She was discharged to the ward in apparently good condition.

By early afternoon of the same day the patient became cyanotic with associated rapid respiration. She developed a chill with a subsequent temperature elevation to 104° F. Urinary output by retention catheter was almost negligible and what was obtained was highly colored and concentrated. A diagnosis of a moderately severe hemolytic transfusion reaction was made and the following treatment was instituted: oxygen was given, normal saline was administered intravenously, and an attempt to alkalinize was made with one-sixth normal sodium molar lactate. The temperature dropped slightly. By that evening blood stained urine was draining from the catheter. Free hemoglobin determinations on the plasma were not done but the Benzidine and Guiac tests for blood in the urine were positive. The icteric index and the serum bilirubin rose steadily in the next 36 hours and the patient became clinically jaundiced.

The next day the patient's blood was again grouped. The patient actually was Group O, Rh negative, and during surgery had received Group O, Rh positive blood. Her husband was later found to be Rh positive, but she had six uneventful full term pregnancies with six normal living children.*

In conjunction with the Medical Department a conservative course of management was decided upon, involving primarily maintenance of proper electrolyte and nonelectrolyte and fluid balances; treatment of the secondary anemia with small compatible blood transfusions; and watchful waiting. It was hoped that an increase in kidney function would result. Some reports in the literature have mentioned successful outcomes with this method of treatment even though the period of oliguria existed for as much as fifteen days.

By the fourth postoperative day the daily 24 hour urine output was ranging between 100 and 300 cc. The serum blood urea nitrogen rose to 100 mgm. per cent. Cystoscopy at this time revealed that the ureters were patent.

Caudal Analgesia

On the fifth postoperative day the blood urea nitrogen was 120 mgm. per cent and the patient's general condition was getting progressively poorer. Because it has been shown to be of some value in the relief of the vasospastic element present in the various oligurias and anurias associated with the pre-eclampsias and eclampsias of pregnancy it was suggested that caudal analgesia might be tried.[7] Present knowledge of the renal histopathology involved in this disease points primarily to tubular damage with degeneration and obstruction. However, vasospasm being of uncertain significance, it was decided to proceed with the caudal.

On the afternoon of the fifth postoperative day caudal analgesia was instituted using a total of 495 mgm. of

*Recent blood studies done by Dr. Levine at the Ortho Research Laboratory reveal the fact that the husband is Rh positive (Rh_1 heterozygous), and the patient is Rh negative with serum containing blocking antibodies in a titer of 1:512.

metycaine and raising the level of analgesia to T6. This was maintained for six hours and then allowed to regress for four hours. Additional injections were made (the inlying catheter technic being used) again maintaining the level to T5 for another six hour period. The caudal was then discontinued in accordance with the original plan which was not to exceed 18 hours in total length. During the period of analgesia no demonstrable change in the urinary output was observed. The blood urea nitrogen continued to rise. The patient did experience her most comfortable hours since surgery, but as far as could be determined it was the only benefit obtained.

Renal Decapsulation

By the seventh postoperative day the blood urea nitrogen was 146 mgm. per cent, the serum creatinine was 17.6 mgm. per cent, and the patient's condition was generally poorer. The 24 hour urinary output had dropped to 150 cc. Although conflicting reports have appeared in the literature, the Department of Urology felt that a renal decapsulation was indicated.[1,6] It was apparent that the patient was rapidly growing worse and any possible helpful procedure was felt to be indicated. On the evening of the seventh day, under local infiltration anesthesia, the left kidney was decapsulated. The kidney appeared enlarged and purplish in color but on incision of the capsule there was no significant bulging of the parenchyma. Because of this it was felt that the element of increased intrarenal pressure was probably non-existent. Unfortunately, no biopsy of the kidney was taken.

During the three days following renal decapsulation the patient grew progressively worse clinically. She was disoriented and lethargic. The urinary output in 24 hours was now only 25 cc. The blood urea nitrogen was 185 mgm. per cent, and the creatinine had risen to 22.8 mgm. per cent. Because of the increasing and profound uremic condition it was decided in conjunction with the Department of Surgery to institute peritoneal lavage.

Peritoneal Lavage

On the morning of the eleventh postoperative day, under local analgesia, peritoneal irrigation was begun and was continued for approximately 82 hours. Without mentioning details the procedure involved numerous and burdensome laboratory determinations, continuous suction with an electric pump, preparation and sterilization of the irrigating fluids in large quantities, scrupulous attention to the problem of fluid balance and almost constant observation.[2,3,4,5,8,9]

An inflow was established by placing a mushroom type soft catheter in the left upper quadrant of the abdomen, and the outlet by fixing a regular surgical sump drain in the right lower quadrant. The inflow was connected to an intravenous Murphy drip and the outflow was attached to the the electric pump suction. A trap bottle was interposed in the outflow setup between the patient and the pump to prevent moisture from reaching the motor. Regardless of the length of the tubing in the outflow system condensation will take place and reach the motor unless the trap bottle is employed. For irrigation, Hartmann's solution was used with 5 per cent glucose added to raise the hypertonicity of the fluid. In the first twenty-four hour period approximately 30 liters were run through the circuit and later this was increased to from 36 to 40 liters in 24 hours. Many daily studies of the blood metabolites were done, plus daily urea nitrogen and chloride determinations on the urine and dialyzed fluid. In addition cultures were also run on the recovered irrigating solutions daily. Streptomycin was administered in doses of 0.25 Grams every four hours orally, and 0.25 Grams every six hours intramuscularly. Sixty thousand units (60,000 units) of penicillin were given intramuscularly every three hours and 100,000 units were added to each liter of irrigation fluid. Twenty (20) mgms. of heparin were also added to each 1000 cc. of irrigation fluid.

By the fourth day, even with these antibiotic precautions, the patient showed signs of early peritonitis as evidenced by a rise in temperature, minimal but definite peritoneal irritation with rebound tenderness, and positive cultures from the dialyzed fluid. Pseudomonas æroginosa was the prominent organism found.

Figure 1 demonstrates and recapitulates graphically the progress of the uremia leading to the institution of the lavage. Note that about the time this procedure was started the blood urea nitrogen had risen to 211 mgm. per cent, and the creatinine 24.6 mgm. per cent, and that at the end of 82 hours of lavage the blood urea nitrogen was 104 mgm. per cent with the creatinine at 12.5 mgm. per cent.

The patient was clinically much improved from the standpoint of orientation and both subjective and objective symptomatology. Because of the beginning peritonitis, however, the lavage was discontinued and 1,000,000 units of penicillin plus 2.0 Gms. of streptomycin were left in the peritoneal cavity. It was felt that a fulminating generalized peritonitis would not only disturb the dialyzing potentialities of the peritoneum but destroy the patient as well. It was not certain that later reinstitution of the procedure might not be necessary.

Figure 2 shows that on the last day of the lavage (fourteenth postoperative day) the urinary output was 450 cc.—the highest of any day since surgery. During the subsequent days this was followed by successive outputs of 550 cc., 1000 cc., 1200 cc., 1750 cc. This diuresis seemed to indicate a return of kidney function.

Four days after discontinuing the lavage the blood urea nitrogen rose again to 165 mgm. per cent, and the creatinine to 18 mgm. per cent. The peritonitis, however, was improved. The re-establishment of the lavage was considered, but was withheld when a slight drop in metabolites and a steady increase in urinary output was noted on the nineteenth postoperative day. The patient's course from here on showed continued improvement and ended with complete recovery.

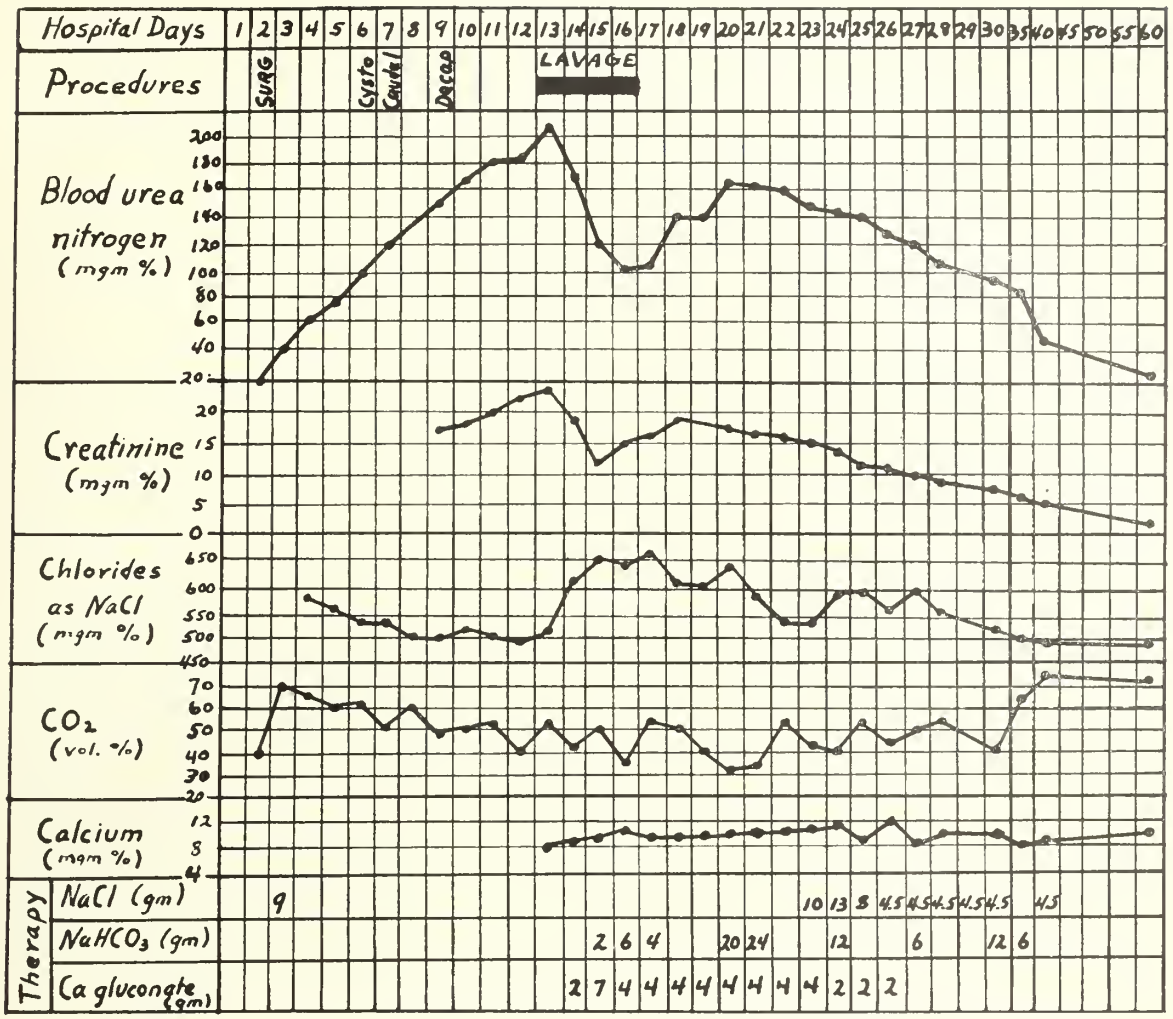


Fig. 1. Peritoneal lavage in treatment of temporary renal insufficiency effects on blood electrolytes and non-electrolytes. (Case of A. E.)

In recapitulating and evaluating the charts the blood urea nitrogen and creatinine recordings are self-explanatory.

The blood chlorides remained at normal levels but with institution of peritoneal irrigation it will be noted there was a distinct rise. This is explained by the inevitable absorption of irrigation fluid from the peritoneum despite the hypertonicity obtained by the addition of glucose.[9] Sodium chloride was administered in gram quantities on the days designated in Figure 1. Note that no chlorides were necessary from the first postoperative day until diuresis had been fairly well established.

The carbon dioxide combining power was kept for the most part within normal limits with maximum effort to maintain an alkaline rather than an acid tendency. Sodium bicarbonate was used in this connection and administered as indicated.

Calcium levels were controlled by the intravenous use of calcium gluconate in gram quantities on the designated days.

The story of the fluid intake and output is graphically illustrated in Figure 2. Note that the weight showed some decrease during the lavage indicating partially that the body fluid balance was not out of control. There were never signs of pulmonary edema though a mild state of overhydration was evidenced by the presence of peripheral and sacral edema which persisted until the patient was nearly ready for discharge.

The secondary anemia associated with the uremia developed rapidly and was most resistant to therapy. Transfusions were given as indicated in Figure 2 and oral hematopoietic stimulants were administered, but the hemoglobin was still only 60 per cent on the 58th postoperative day.

The patient's diet for the days immediately following lavage consisted in high carbohydrate, high fat, zero pro-

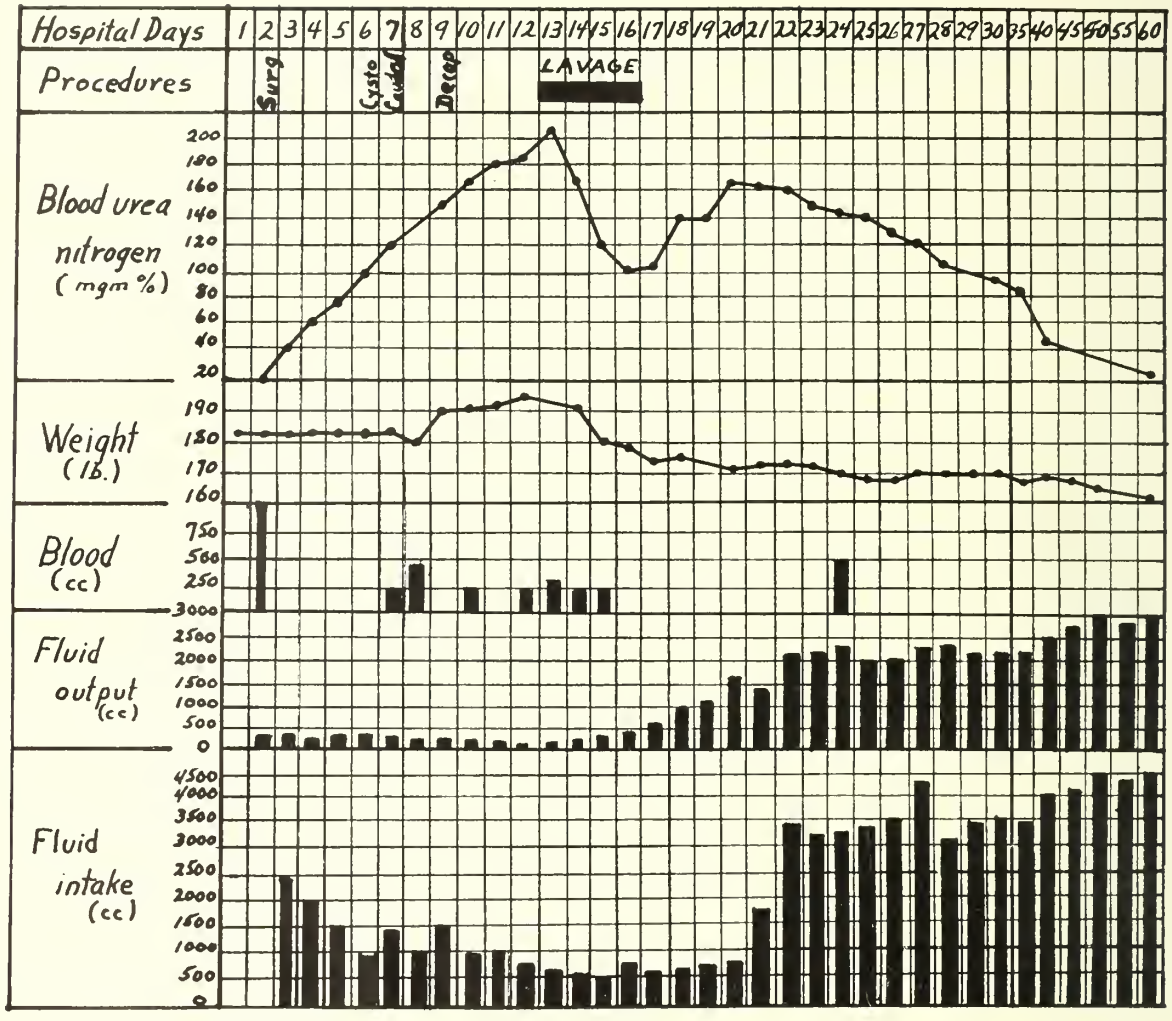


Fig. 2. Peritoneal lavage in treatment of temporary renal insufficiency fluid balance. (Case of A. E.)

tein content. It was felt that the damaged kidneys were incapable of handling more than the already existent enormous load of nitrogenous metabolites.

Comment

This case demonstrates the use of several major therapeutic procedures in the treatment of temporary renal insufficiency. It offers an unusual opportunity to compare the results of these as separate entities even though they were applied in sequence to one individual patient.

It also demonstrates the importance of careful and adequate blood grouping with particular reference to the Rh antigen. While whole blood is without doubt the most efficacious agent in parenteral fluid therapy, this case emphasizes the lethal dangers of poorly or improperly controlled administration.

With this case there can be little doubt that the caudal analgesia or the renal decapsulation had the slightest effect. Neither procedure in any way altered the progressive development of the uremia.

Relative to the effect of peritoneal lavage it is clear that this procedure was related chronologically to the beginning return of kidney function. The patient would probably have progressed into an irreversible uremic syndrome with an inevitable fatal outcome if the diuresis and the dramatic lowering of blood metabolites had not been brought about by peritoneal dialysis.

A better answer to the treatment of these problems is likely. The perfection and clinical application of external dialysis may become a better procedure than the one here employed. Peritoneal lavage on the other hand is probably better than dialysis applied through various segments of either the large or the small bowel.[9] Peritoneal lavage is fraught with technical difficulties and requires scrupulous attention to the details of fluid balance and avoidance of peritonitis. Careful selection of irrigating

fluids is essential. Because fluid is absorbed from the peritoneum under any circumstances the hypertonicity of the irrigating fluid is very important in combating overhydration. Dehydration is much easier to control than overhydration, and wide variations in the hypertonicity of the irrigation fluids are to be avoided.

Peritonitis seems to be the foremost hazard and may at times be impossible to avoid. This case would support the ideas of Kolff who is one of the leading advocates of intermittent lavage in clinical uremia.[9] A full blown peritonitis not only places the patient's life in jeopardy, but reduces seriously the dialyzing potentialities of the peritoneum. For this reason the shorter, intermittent type of lavage periods, which undoubtedly reduce the risk of serious peritonitis and retain the dialyzing property of the peritoneum, are to be recommended.

Finally, more experience with this and other methods of treatment are necessary before the relative therapeutic value of peritoneal lavage may be determined. The result in this case would seem to recommend it in any case of uremia that threatens to terminate fatally.

Summary

1. A case of temporary renal insufficiency due to a hemolytic transfusion reaction is presented.

2. Several therapeutic methods are evaluated including caudal analgesia, renal decapsulation, and peritoneal lavage.

3. Caudal analgesia and renal decapsulation failed to alter the progress of the uremic syndrome.

4. Peritoneal irrigation effected an immediate dramatic lowering of the blood metabolites with marked clinical improvement in the patient.

5. Returning renal function began on the fourteenth postoperative day and improved progressively thereafter. This return of kidney function is not believed due directly to the use of peritoneal lavage, but it is felt that the marked lowering of the blood metabolites in the short span of 82 hours of lavage halted the progress of the uremia from an inevitable fatal termination for a sufficient period to enable the kidneys to regain their normal functions.

6. The method is recommended as worthy of serious consideration in any case of uremia that threatens to have a fatal outcome.

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"U" GETS CANCER RESEARCH GRANT

An $11,356 grant for study of cancer at the University of Minnesota during the coming year was announced by the National Cancer Institute in Washington.

The money will enable university researchers to continue studies started under a similar grant for 1948. The research on synthesis and maintenance of intracellular enzymes—essential body chemicals—will be directed by Drs. John J. Bittner, H. Buss Steinbach and Sol Spiegelman.

In addition, the university regents were granted $10,800 to finance new studies of stomach cancer.

The awards to the University of Minnesota are part of a $508,527 program of laboratory and clinical cancer research to be conducted in 1949 by non-federal institutions.

Concomitant Extra-uterine and Intra-uterine Pregnancy

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THE coexistence of an extra- and intra-uterine pregnancy is more correctly termed combined pregnancy. Parry so designated this condition as combined pregnancy in 1876. Simultaneous pregnancies are sometimes termed compound pregnancies. This latter term should be reserved more appropriately for those cases in which an intra-uterine pregnancy supervenes weeks, months, or years after spontaneous resolution, mummification, lithopedian formation, or adipocere degeneration of an extra-uterine gestation.

HISTORICAL

This interesting condition has existed since the beginning of man. The first case reported in the literature is credited to Duverney, in 1708. His case was diagnosed at autopsy. In 1898, Strauss was able to collect only 32 cases. Since the turn of the century, the number of reported cases has grown rapidly. Zinke reported 88 cases in 1902. In 1904, Simpson collected 113 and Neugebar increased the number to 244 by 1913. Novak added 32 through 1926. Since then, many authors, notably Gemmell and Murray, Mitra, Mathieu, Ludwig, Studdiford, and many others have added to the number reported, so that the total through 1946 had reached 357. It may be said that up to the present, less than 400 cases have been reported. Stander does not consider the condition rare. The author agrees with Stander's opinion.

Nevertheless, many gynecologists in active, private, and clinic practice, have never seen a case. For this reason, it was considered worthwhile to discuss some aspects of this condition and to report a recent case cared for at the Minneapolis General Hospital.

MECHANISM OF OCCURRENCE

Combined pregnancy occurs usually as a result of twinning. In one reported instance (Furniss case) it resulted in a triplet pregnancy. In this case, the patient was operated upon for a ruptured left tubal pregnancy. Intra-uterine pregnancy was recognized at operation and 243 days later the patient was delivered of twins, a boy weighing 7¼ pounds and a girl whose weight was 7 pounds.

Doubtless, the usual occurrence results from binovular fertilization. One fertilized ovum imbeds in the tube or ovary and the other fertilized ovum imbeds within the uterine endometrium. This may result from a single coitus, or two ova may be fertilized at different copulations within a relatively short interval, true superfecundation. Theoretically, combined pregnancy may result from superfetation, but no case of superfetation has ever been cited which will stand critical analysis.

DIAGNOSIS

It is obvious that the preoperative diagnosis of concomitant pregnancy is extremely difficult. In Neugebar's first series of 170 cases, the diagnosis was made either antepartum, or preoperatively in only 7 cases (4.1 per cent). In his second series of 74 cases, 8 cases were correctly diagnosed (10.8 per cent). In Novak's 32 collected cases, plus two postscript cases, 34 in all, the diagnosis was made in 3 (8.8 per cent). An unequivocal correct diagnosis in ordinary ectopic pregnancy is not easy. In a series of 102 ectopics reported by me in 1942, a correct diagnosis was made in 65.6 per cent, compared with an average correct diagnosis of 64.6 per cent in 915 reported cases.

Many factors obscure the condition in combined extra- and intra-uterine pregnancy. Threatened or incomplete abortion of the uterine pregnancy may dominate the picture. Conversely, the extra-uterine pregnancy may obscure the situation with its attendant symptoms being predominant.

At operation, the intra-uterine pregnancy may be missed, if not very far advanced, because the uterus is usually slightly enlarged and softened in tubal pregnancy. So able, competent, and experienced a gynecologist as Novak missed the diagnosis of the intra-uterine pregnancy in his case. He stated, "There was no way for us to determine the existence of uterine pregnancy at operation." In the series of ectopics reported by me, previously mentioned, the uterus was described as being enlarged in only one fourth of the cases.

When the intra-uterine pregnancy is more advanced and the extra-uterine pregnancy is silent, the diagnosis is even more difficult.

FATE OF THE EXTRA- AND INTRA-UTERINE FETUS

Termination of the combined pregnancy is analyzed by several authors. Allowance must be made for some overlapping and reduplication.

In the Novak series of 34, 17 aborted, 3 probably aborted, hysterectomy was done twice on the pregnant uterus containing fibroids, one probably went to term, one delivered prematurely at eight months gestation, and the remaining 10 went to term. An abdominal section was done on 3 cases at or near term (cases of Bogdanovich, Dubose, and Araujo). Of these six babies, one intra-uterine child died at birth, one extra-uterine child 18 hours after birth. Both extra- and intra-uterine children were living 22 months after birth in Dubose's case, and Araujo's case the intra-uterine baby died; the extra-uterine baby survived.

There were three maternal deaths, a maternal mortality of 8.8 per cent in the Novak series. Gemmel and Murray classified 93 cases discovered before abortion of the uterine ovum in the first half of pregnancy. In this group 32, about one-third, went to term, and 36 aborted after operation for the ectopic gestation. There were nine maternal deaths, a mortality of 9.7 per cent.

Ludwig summarized 20 cases including three of his own from 1934 to 1938. Three of these went to term with a salvage of two uterine children and one extra-uterine child. One delivered a hydrocephalic infant at eight months gestation which died one hour after birth.

Mathieu added 57 reported cases through 1936. Twenty-five of his series aborted and twenty-four did not abort after laparotomy for the ectopic pregnancy. He states the majority of the twenty-four went to term.

The combined collected cases of the four authors (Novak, Gemmel and Murray, Mathieu, Ludwig) total 204. Of these, 69 surely went to term and one probably did so, a percentage of approximately 33 per cent.

Our case at the Minneapolis General went to term. The case history briefly is as follows:

A 28 year old colored girl was admitted to the hospital July 16, 1947. She had delivered six full term babies, all living and well. The oldest child was age 13. The youngest was aged four months, delivered March 16, 1947. She menstruated normally one month after the birth of her last child, the onset being April 16, 1947, duration seven days. On May 15, she started menstruating, flow moderate, and the duration was only three days. She had had no miscarriages, menarche at age 13. The interval was 30 days, the duration was seven days, flow profuse for three days. She always had severe backache and cramps during her menses.

Past History. Bronchopneumonia at age 2. Had a nontoxic colloid goiter. Venereal disease denied.

Present Complaint. On admission she complained of low abdominal pain, crampy in character, similar to her usual menstrual pain. Her last menstruation started June 18, 1947, duration four days, instead of usual seven days. One week after this period ceased she had some vaginal bleeding, spotting in character, but increased in amount on exertion. She had intermittent cramps for two weeks previous to admission. At 9:00 A.M. the day of admission, she experienced sudden severe lower left quadrant pain. Pain was described as crampy in character, lasted for 30 minutes, subsided, then recurred.

Physical Examination. Her admission blood pressure was 116 systolic, 88 diastolic; pulse 76; temperature 97.8° F. Aside from a diffuse colloid goiter, the essential findings were a palpable mass in the left lower quadrant, no muscle spasm; slight rebound tenderness; very slight vaginal bleeding. Speculum examination showed a closed cervix, a small amount of old blood in the vagina. Bimanual examination revealed slight tenderness on motion of the cervix, a uterus described as about the size of an eight weeks pregnancy, and a tender adnexal mass to the left of the midline and just above the symphysis.

Diagnosis. (1) Intra-uterine pregnancy with threatened abortion; (2) associated left salpingo-oophoritis; (3) possible ectopic pregnancy.

Hospital Course. From July 16, 1947, to July 21, 1947, she was fairly comfortable. Her bleeding stopped and recurred in minimal amount. Her blood pressure ranged from 110-124 systolic, 60-74 diastolic. Hemoglobin was 70 per cent, WBC 8100, Kline was negative, cultures and smears were negative for Neisserian infection.

On July 21, 1947, she became nauseated, vomited, pain became severe in lower abdomen, more pronounced on the left. She was taken to the operating room. At operation, about 200 cc. of old blood and clots were found in the abdominal cavity. At the middle third of the left tube extending from a perforated area, was a small amniotic sac enclosing an embryo 2 cm. in length. At operation the intra-uterine pregnancy was noted. A left salpingo-oophorectomy was done. The right ovary was examined. It was increased in size and contained a corpus luteum of pregnancy.

Postoperative course was uneventful, and she was discharged on her tenth postoperative day. Friedman tests on July 21, 1947, and July 30, 1947, were positive.

Subsequent Course. This patient was referred to the prenatal clinic where her course was uneventful. She was admitted to the hospital February 7, 1948, in labor. She labored four hours and delivered a normal female infant weighing 2775 grams. It is now 7½ months of age and in excellent condition.

Discussion

This patient may be classified as the type of combined pregnancy in which the intra-uterine pregnancy first dominated our attempt at diagnosis, until her recurrent acute flareup of symptoms on July 21, 1947, after five days of relative comfort with minimal vaginal bleeding. We always had ectopic pregnancy in mind, but on the day of operation, we considered the diagnosis of torsion of the left tube and ovary complicating an intra-uterine pregnancy.

Summary

1. This study shows that combined pregnancy is not so rare as we are wont to believe.

2. It should be kept in mind in abortions and ectopic gestations.

3. The diagnosis of this condition is extremely difficult.

4. Approximately a third or more cases will go to term if properly handled. More mothers and babies can be salvaged if we are more alert in our diagnosis, even at laparotomy.

5. The mortality for mothers and fetus is very high.

6. The author is of the opinion that intra-uterine twinning occurs much more frequently than we suspect—with one twin being destroyed or resorbed early.

7. He also holds the view that ectopic gestation occurs quite frequently and that the fertilized concept is absorbed or extruded during the first two weeks in the ovum stage.

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DISCUSSION AND CASE REPORT

Roger S. Countryman, M.D.
St. Paul, Minnesota

Concomitant intra- and extra-uterine pregnancy is of such infrequent occurrence, as Dr. Sadler has so ably demonstrated in his excellent review of the subject, that none of us is likely to recognize the condition when first encountered. So far as I can determine, my case is the only one on record in the Charles T. Miller Hospital since its opening in December, 1920; and I offer no apologies for presenting it now, nor for failing to diagnose the remaining intra-uterine pregnancy until several weeks following the extra-uterine operation. I believe, also, that routine curettage, before laparotomy for suspected ectopic pregnancy, should be avoided even though we might thus salvage but one infant in many years of practice.

The case I wish to report is that of a 31½ year old para one who was admitted to the Miller Hospital at 2:50 A.M. July 21, 1943, complaining of irregular vaginal bleeding associated with recurring bilateral lower abdominal, chest and shoulder pains, nausea, vomiting and fainting spells.

Her last normal period began June 9th (usual cycle being 25-28 days with previous periods March 27th, April 21st, and May 17th). She had nausea and vomiting beginning about July 15th. On July 18th, she had a rather sudden attack of sharp pain across the lower abdomen which doubled her up, but soon subsided leaving her fairly comfortable the next day except for the nausea and vomiting. July 20th nausea and vomiting increased with severe headache, and by evening abdominal pains recurred, extending into the chest and shoulder girdle, vaginal bleeding was noted and she fainted several times.

On admission, examination revealed: Moderate vaginal bleeding; marked tenderness and rigidity of abdomen; apprehension; B.P. 120/68—T.P.R. 97°-104-24; cervix boggy, closed, mobility limited and palpation increased spasms of pain; fornices tense and uterus and adnexa not clearly outlined.

Laboratory Report: Hgb. 9.8 gms. (or 58 s.u.); RBC, 2,980,000; WBC, 14,300 with 83 per cent neutrophiles, 15 per cent lymphocytes, 2 per cent monocytes and RBC's normal.

At operation there was a gush of liquid blood with small clots on opening the peritoneal cavity. Left tube was moderately thickened and the dilated fimbriated end contained a partially extruded, adherent blood clot. Lying free in the liquid blood-filled lower abdomen and cul-de-sac was a larger semi-organized clot about the size of a hen's egg. Uterus was forward, appeared about normal except for slight congestion, and the right tube and both ovaries were normal. (Unfortunately no note was made of the presence or location of a corpus luteum.) The left tube was excised at the cornu, leaving the ovary, clots were removed and the abdomen closed, leaving the liquid blood and an added 500 cc. of warm saline in the peritoneal cavity.

Pathologist's Report. Gross: The specimen consists of a tube about normal in length and 15 mm. in greatest diameter. The wall is swollen and edematous. The fimbriated end is open. The lumen contains blood clot. There is also a large blood clot free from the tube about the size of an egg. This clot does not seem to contain any organized tissue. Microscopic: The mucosa of the tube is distorted, flattened, edematous and congested. The wall is likewise diffusely edematous and congested. It is infiltrated with a small number of leukocytes. The lumen is dilated and filled with a clot of blood and fibrin which is infiltrated with many leukocytes and also a few clumps of chorionic cells. Diagnosis: Ectopic tubal pregnancy. (Dr. Kano Ikeda.)

One thousand cubic centimeters of 5 per cent glucose in distilled water was given intravenously on patient's return from surgery.

Convalescence was uneventful aside from a temperature rise to 102° twenty-four hours postoperative, which dropped to 100° that evening and leveled to normal the fourth postoperative day. There was little or no vaginal bleeding after the second day following surgery, also the recurrence of her nausea and vomiting on first sitting up the sixth day failed to arouse any suspicion of

her subsequent course. She was discharged July 31st without any transfusion in spite of a Hgb. of 8.5 gms. (or 51 s.u.).

When seen August 14th she still complained of nausea and vomiting, especially each morning, had nocturia and examination showed uterus quite boggy soft in upper corpus and fundus, adnexa negative, Hgb. 60 s.u. Only then was there a thought that a possible simultaneous (concomitant, co-existent, combined) intra-uterine pregnancy might be continuing in spite of the lost ectopic twin. On her return August 30th the uterus was found to correspond in size to a pregnancy of nine to ten weeks duration. Motion was felt early in October, and on March 17, 1944, a 7 lb. 3½ oz. female was delivered spontaneously, the infant being perfectly normal except for a very moderate cleft palate which necessitated breast expression and bottle feedings with a special type of nipple.

Examination two months postpartum revealed a pigmented mid-line suprapubic scar with moderate keloid formation, uterus anteverted, well involuted, right adnexa and left ovary apparently normal.

Previous and Subsequent History: Married Sept. 21, 1940. Husband A & W. No history of twins on either side. No serious illnesses or previous operations.

Cta. 13 yrs., 28 day cycle, duration 6 to 7 days; profuse flow with cramps first 24 to 36 hrs. Leucorrhea always.

1st pregnancy: L.M.P. June 5, 1941; motion 10/20±. Outlet forceps delivery of 6 lb. 5½ oz. female March 4, 1942.

2nd pregnancy: L.M.P. June 9, 1943—ectopic (left) operation July 21. Motion 10/early. Spontaneous delivery of 7 lb. 3½ oz. female March 17, 1944.

3rd Pregnancy: L.M.P. June 15, 1945. Motion 10/20±. Spontaneous delivery of 6 lb. 12 oz. female March 24, 1946.

Book Reviews

Occupational Marks and Other Physical Signs, by Francesco Ronchese, M.D., 181 pages, 151 illustrations. New York: Grune & Stratton, 1948. $5.50.

One's mode of life leaves telltale signs on every individual. This interesting book catalogs the various occupational marks on the human body resulting from habits, diseases, accidents, or operations. The text, though brief, describes accurately the stigmata seen in members of various professions and trades.

The mode of acquisition of the characteristic marks or calluses is clearly described. There are many interesting illustrations to supplement the text. The illustrations constitute a large part of the volume as is fitting in a book of this type. The similarity between some of the stigmata and changes produced by various dermatoses is also illustrated. One can readily see what confusion can arise and what care must be exercised in evaluating some of the changes seen on the body.

Doctor Ronchese makes his essay one of considerable value in forensic medicine and criminology where personal identification by means of acquired markings has its greatest value. The information given makes the book a valuable manual for the pathologist and criminologist as well as fine reading for all physicians. I. F.

Office Endocrinology, by Robert B. Greenblatt, M.D., 3rd edition, 280 pages, illustrated. Illinois: Chas. C. Thomas Co., 1947, $4.75.

This manual on endocrinology is written for the practicing physician. The third edition includes a new chapter on the interpretation of basal temperature records; the two hour pregnancy test of Kupperman is described. It is well illustrated, and concisely brings the reader up-to-date on the ever-changing views regarding hormone therapy.

As in the previous editions, salient points on the physiology of menstruation are given and a colored plate of secretory type of endometrium is included. The treatment of irregular uterine bleeding is well outlined. More emphasis could have been placed on thyroid medication but it is mentioned in a short chapter. This synopsis includes the handling of acne, obesity and sterility which are common complaints today.

The physician who reads this manual will probably prescribe hormones less frequently but more judiciously than heretofore. Every practicing physician will welcome this book from a reliable source as a guide to better understanding of such a confusing subject as endocrinology. N. W.

A Textbook of Pathology, by E. T. Bell, Professor of Pathology, University of Minnesota. Contributors, B. J. Clawson, M.D., and J. S. McCartney, M.D.; 6th edition, enlarged and thoroughly revised with 500 illustrations and four color plates; 910 pages. Philadelphia: Lea & Febiger, 1947. $10.00.

Physicians who are familiar with Dr. Bell's textbook will welcome this new edition. Those who have not read it or consulted it might profitably do so. The sixth and latest edition is in the same tradition, as a teaching book, as the predecessors. The publishers have aptly characterized it as "brief yet comprehensive, clear and definite, well-written and well-organized."

Dr. Bell has drawn upon his large personal experience. Controversial material is sometimes presented from the author's point of view, and some interesting points are treated briefly. Without this sort of compromise, it is doubtful if so much could have been written in this convenient-size volume. The chapter on renal diseases clearly explains and illustrates the author's concepts, which are expanded in his book, *Renal Disease,* recently published. Sufficient references are placed throughout the book so that the reader may easily be directed to the more extensive works.

This is an up-to-date textbook of pathology, and it is recommended to students and practitioners alike for reference or study. It is probably the best textbook of pathology in the English language. H. W.

Progress in Neurology and Psychiatry: An Annual Review. Volume III, edited by E. A. Spiegel. New York: Grune & Stratton, 1948, 661 pages.

This is the third year that this review has been published. The excellency of this work points toward a continued success of this project. This volume comprises one of the finest reviews of the fields of neurology and psychiatry. The editor has obtained the assistance of sixty-eight contributors each of whom has done an excellent job in selecting his articles and presenting his material in a brief but clear and comprehensive fashion. The book contains thirty-seven chapters covering the basic sciences, neurology, neurosurgery, and psychiatry. Each chapter is well organized. With the increasing number of publications in these fields, this book appears as a welcome aid to anyone interested in a complete and instructive review of the literature in neuropsychiatry. A. B. B.

Massive Hemorrhage Into the Gastro-intestinal Tract in the Last Trimester

A Case Report

Mancel T. Mitchell, M.D.
Minneapolis, Minnesota

THIS case is presented because of the unusualness of this hemorrhagic complication late in pregnancy, the diagnostic problems involved, and the decision in regard to management.

Duodenal ulcer is a rare complication of pregnancy. It is not mentioned in the standard obstetric text books in wide use in American medical schools. Sandweiss reported only one case with active ulcer symptoms in 70,310 pregnancy hospital admissions.[1] This is in rather sharp contrast to other complications of the gastro-intestinal tract such as appendicitis, cholecystitis, and ulcerative colitis.

Case 1. The patient, S. R., MGH No. 6631-A, age 28 years, para 2-0-0-2, an unregistered multipara, was admitted to the obstetric service of the Minneapolis General Hospital at 4:07 P.M., August 30, 1948. Her last menstrual period began Jan. 7, 1948; her expected date of confinement was calculated to be Oct. 14, 1948.

The patient was ambulatory. She complained of dull pain in the upper portion of her abdomen, more noticeable when she was recumbent, of five days duration. She also stated that her abdomen seemed unduly large. She had had no regular antepartum care. She had experienced some nausea and vomiting during the second and third months. She consulted a private physician on July 26, 1948 (one visit) at which time she was told that there was sugar in her urine. A salt-free diet was advised because of slight ankle edema. Otherwise, her pregnancy had been uneventful until the onset of the upper abdominal pain which caused her to come to the hospital.

The patient described the pains in her upper abdomen as sharp and shooting in character. The pains seemed to spread laterally across the top of her uterus when she turned from side to side in bed. She stated that her abdomen had increased so in size during the last two months that it was now difficult for her to walk during the last week. She had noted considerable fetal motion on the right side of her abdomen. Since the first week of July 1948 she had noted swelling of her ankles. This did not subside on bed rest. She had noted a weight gain of approximately 40 lbs.

Her past health had been generally good. She had had measles, mumps, varicella, and pertussis when a child. Sugar had been noted in her urine when she had been pregnant. She had had no operations, serious injuries, or illnesses. History review by systems was essentially negative.

The patient was married in January, 1941. Her husband, age 45 years, is living and well.

CTA: Menarche at 14 years of age; menses regular q. 24-28 days; 4 to 5 days duration; moderate discomfort on the first day.

Her first pregnancy was a normal full term gestation. Delivery Aug. 1, 1941, was instrumental; infant was said to weigh 10 lbs.; child is living and well. No other details are available.

Her second pregnancy was uneventful and unsupervised. She noted swelling of her ankles during the last trimester. She was delivered spontaneously of an apparently normal 12 lb. male infant at Minneapolis General Hospital on April 15, 1944. Glycosuria was noted at this time.

Family history: Father, 70, and mother, 70, are both living and well. One brother, 33, and one sister, 30, are living and well. No data on grandparents.

OH: Housewife.

Physical examination on admission to the hospital was essentially negative except for the findings incident to her pregnancy. TPR normal. BP 116/60. Weight 148 lbs. The patient's abdomen was so large that she had moderate difficulty in resting comfortably in bed. It was quite difficult for her to walk. The height of the fundus was 33 cm. above the symphysis; the uterus was very tense; fetal parts were ballotable but it was impossible to accurately outline the fetal position by abdominal palpation because of the marked hydramnios. There was four plus pitting edema of both feet, ankles, legs, extending upward to involve the thighs and vulva to a mild degree. Rectal examination revealed the cervix soft and undilated. The presenting part was floating.

A provisional diagnosis of twin pregnancy was made. The patient was placed on a regimen of strict bed rest, a salt-free diet, and ammonium chloride gr. xv q.i.d. An x-ray film of her abdomen confirmed the diagnosis of twin pregnancy, an ROA and an LSA.

Laboratory examinations: Aug. 31, 1948: Blood serology test for syphilis was negative. Hemoglobin 88 per cent (Sahli). Leukocyte count 4,500 with 68 per cent neutrophiles, 29 per cent lymphocytes, 2 per cent monocytes, 1 per cent eosinophiles. A catheterized urine specimen was acid, sp. gr. 1.030, faint trace of protein, negative sugar, 5 to 8 leukocytes/HPF. Blood urea nitrogen 16 mgm. per cent. On Sept. 1, 1948: Fasting blood sugar 70 mgm. per cent; plasma proteins 5.3 Gm. per cent.

The patient was continued on bed rest and observation without any particular change in her status. Her blood pressure remained within normal limits. Her weight remained stationary until Sept. 7, 1948, when it

was noted as 143½ lbs. The edema of her lower extremities decreased somewhat but not remarkably.

At 9 A.M. ward rounds on Sept. 7, 1948, it was reported that the patient had had an emesis during the night (no details as to content or character) and that she had passed a large black-brown tarry stool early that morning. Her upper abdominal pain was somewhat more intense. Dr. Mary Magee examined the patient and noted that both fetal hearts were regular and of good quality. The patient appeared quite pale. Her pulse rate was regular at 80/min. An emergency hemoglobin determination was requested and found to be 54 per cent. At 1:30 P.M., Dr. Magee again saw the patient and noted that she was pale and apprehensive. She had passed two large brown stools. Her pulse rate was 112/min.; her blood pressure 140/92. The stool grossly appeared to be brown-red in color and apparently contained fresher blood than had been passed earlier that morning. The patient passed several large, partially liquid brown-red stools that afternoon. The fetal hearts remained regular and of good quality. A re-check on the patient's hemoglobin at 3:45 P.M. was found to be 53 per cent.

A transfusion of 500 cc. of cross-matched whole citrated blood was started at 4:30 P.M. Another was started at 7:15 P.M. At this time the patient complained of being thirsty, and of soreness in her epigastrium and back. She was given morphine sulphate gr. 1/6 and scopolamine HBr gr. 1/200 hypodermically. A provisional diagnosis of hemorrhage into the upper gastrointestinal tract, probably from a duodenal ulcer, was made. It was decided to treat the patient expectantly with multiple blood transfusions. Dr. Paul Larson was asked to see the patient and he concurred with the diagnosis and the course of treatment. Another 500 cc. of blood was started at 10:45 P.M. and another 500 cc. at 1:15 A.M., Sept. 8, 1948. The patient's pulse rate ranged between 100 and 130/min. Her blood pressure ranged between 120—130 systolic and 80—90 diastolic. By 3 A.M., Sept. 8, 1948, her pulse rate was fairly stable at 100/min. and her blood pressure 134/92.

At this time the patient began to complain of irregular menstrual-like uterine cramps. These became progressively more severe, and it became apparent by 5 A.M. that she was definitely in labor. At 6:35 A.M. she was transferred to the delivery room and prepared and draped for delivery. She was given nitrous oxide with her pains. At 7:01 A.M., she was delivered of the first twin, a double footling breach, from the right sacrum posterior position, a normal female, 2900 Gm., by Dr. M. E. Baker. The infant was a little slow to breathe but responded with oxygen. The second twin, a normal female, 2880 Gm. from the right occiput anterior position followed almost immediately at 7:04 A.M. This infant also was slow to breathe but responded in a few moments. There were no lacerations of the birth canal. The placentas were delivered by expression from the lower uterine segment, the first by the Schultze and the second by the Duncan mechanism, grossly normal and intact. The placentas were separate. The twins were fraternal (dizygotic). There was minimal blood loss during the third stage of labor. She was given ergonovine maleate 0.2 mgm. and Hykinone 4.8 mgm. intramuscularly. The patient was returned to her room in good condition.

Her blood pressure, pulse, and respirations remained stable and were checked at frequent intervals throughout the remainder of the day. Her blood count was checked and found to show: Hemoglobin 65 per cent; erythrocytes 3.2 million; leukocytes 14,800 with 87 per cent neutrophiles. Morphological studies of the stained blood film were reported as normal. The hematocrit was 28 per cent. Her bleeding time was 7′ 3″; clotting time 3′ 30″. Her prothrombin time was 15′ .1″ for the patient and 13′ .1″ for the control. She was given another 500 cc. blood transfusion. Her general condition remained fairly good and there was no further apparent bleeding into her gastro-intestinal tract.

Her feces were checked on Sept. 13, 1948, for occult blood and found 4 plus; subsequent checks on Sept. 17, 18, 27 and 29, 1948, were negative for occult blood.

The remainder of the patient's immediate puerperium was uneventful.

The first twin was placed on formula feedings and did very well (she weighed 3525 Gm. when subsequently discharged from the hospital on Sept. 30, 1948). The second twin expired at 10⅔ hours after progressive periods of anoxia of undetermined cause. An autopsy was requested and permission for this refused.

X-ray studies of the esophagus, stomach, duodenum and small intestine were made on Sept. 13, 1948, and no apparent abnormalities were found. On Sept. 18, 1948, x-ray studies of the large intestine with a barium enema showed no apparent pathology. An x-ray film of the chest was also reported as negative.

A glucose tolerance test on Sept. 16, 1948, revealed:

	Blood Sugar	*Urine Sugar*
½ hour	135 mgm. per cent	Negative
1 hour	405	4+
2 hour	430	4+
3 hour	470	4+

A diagnosis of diabetes mellitus was entertained and the patient was transferred to the medical service for regulation. She was placed on a basal plus 20 per cent diet supplying 1990 calories. This was subsequently increased to C 200, F 150, and P 110. Her blood sugar ranged between 160 and 215 mgm. per cent and there was no glycosuria. She was discharged from the hospital on Sept. 30, 1948, to be followed in the Out-patient Department.

In a critical evaluation of the handling of this patient there are several interesting points to be emphasized. In spite of the history of glycosuria the definite diagnosis of diabetes mellitus was delayed because of the false security which one fasting blood sugar determination gave. A careful review of her old chart plus the history of two overlarge infants should have made us more alert to the possibility of diabetes in this case. One can only speculate on the association of diabetes mellitus and mild

toxemia and the bleeding into the gastro-intestinal tract. There is little question but that the hypoxemia attendant with the massive bleeding had some part in the start of premature labor. The cause of the bleeding was not definitely determined but most probably was from a duodenal ulcer. Gastroscopy was not done but probably should have been included in the diagnostic work-up after the patient had recovered from the active bleeding phase of her illness. One can only speculate on the possible other sources of such massive bleeding—perhaps from a Meckel's diverticulum or from another diverticulum of the small intestine. In regard to the expectant management of this case, the importance of ready availability of adequate supplies of blood for transfusion cannot be overstressed.

REFERENCE

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Meet Our Contributors

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William P. Sadler, M.D., Minneapolis, Minnesota, was graduated from the Johns Hopkins Medical School in 1921; Diplomate in American Board of Obstetrics and Gynecology, Fellow in the American College of Surgeons; Staff Physician at Minneapolis General Hospital.

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Mancel Talcott Mitchell, M.D., Minneapolis, Minnesota, was graduated from the University of Minnesota in 1935; Diplomate of American Board of Obstetrics and Gynecology; Clinical Assistant Professor of Obstetrics and Gynecology, University of Minnesota; Attending Obstetrician and Gynecologist, Minneapolis General Hospital; Attending Gynecologist, Veterans Administration Hospital; Member of Minnesota Obstetrical and Gynecological Society.

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PROGRAM

Combined Meeting of the
Obstetrical and Gynecological Societies of Minnesota, Iowa, Wisconsin, North Dakota
Dedicated to the memory of
JENNINGS C. LITZENBERG
Saturday, October 9, 1948
Minneapolis, Minn.

Morning Session—9 A.M.

1. "Tubo-Uterine Implantation for Re-establishment of Tubal Patency, Preliminary Report"—E. F. Schneiders, Madison, Wisconsin.
2. "Abdominal Stromatosis"—Wm. Keettel, Iowa City, Iowa.
3. "Concomitant Intra- and Extrauterine Pregnancy"—Wm. A. Sadler, Minneapolis, Minnesota. Discussion and Case Report—Roger Countryman, St. Paul, Minnesota.
4. "Disturbance in Absorption of Iron During Pregnancy"—Roy G. Holly, Minneapolis, Minnesota (by invitation). Discussion—John L. McKelvey, Minneapolis, Minnesota.
5. "Prenatal Care"—Gerald Brown, Grand Forks, North Dakota.
6. "The Alleviative Treatment of Varicose Veins in Pregnancy"—H. O. McPheeters, Minneapolis, Minnesota (by invitation).
7. "Extraperitoneal Cesarean Section in Neglected Transverse Presentation"—C. W. Seibert, Waterloo, Iowa.

Afternoon Session—2 P.M.

8. "Ruptured Endometriotic Cysts"—Joseph H. Pratt, Rochester, Minnesota (by invitation).
9. "Massive Intestinal Hemorrhage in the last Trimester" (case report)—Mancel Mitchell, Minneapolis, Minnesota (5 minutes).
10. "Pleuropneumonia-like Infections of the Pelvis"—J. H. Randall, Iowa City, Iowa.
11. "Management of Severe Transfusion Reactions"—F. J. McCaffrey, Minneapolis, Minnesota (by invitation).
12. "Management of Puerperal Sepsis" (case report)—Jos. F. Bicek, St. Paul, Minnesota (5 minutes).
13. "Further Studies on the Milwaukee Cesarean Section Problem"—L. H. Verch, Milwaukee, Wisconsin.

Guest Speaker (4 P.M.)—"Steroid Therapy in Pregnancy Complications"—Dr. M. Edward Davis, Lying-in Hospital, Chicago, Illinois.

7:00 P.M.—BANQUET

Speaker—Frederic M. Loomis, M.D., Piedmont, California

The JOURNAL LANCET

Official Journal of the American College Health Association, Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, Sioux Valley Medical Association, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology.

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Editorial

JENNINGS CRAWFORD LITZENBERG

For age is opportunity no less
Than youth itself, though in another dress,
And as the evening twilight fades away
The sky is filled with stars, invisible by day.

Thus did Longfellow portray one side of a Great Man, taking from History's pages the names of some of those who missed not opportunity to grow with the passing years.

Our mid-west had such a man—still has him—for such was the Life and Character of Jennings Crawford Litzenberg that anyone who knew him would say that his influence lives on. Men gain prominence sometimes through circumstances beyond their control. They attain a measure of true greatness only when they make contributions to human betterment. When they make such contributions, they demonstrate one aspect of a great Truth: "The Kingdom of God is within you." One need look no farther for finite evidence of Immortality.

Doctor Litzenberg or "Litz" or "The Chief," as he was variously known to thousands of his friends, made many such contributions. He was a Great Man.

It would not be possible in far-too-brief editorial comment to list them all. Nor is it necessary. He would not like it for he always shrugged off the many honors which came to him with the remark that they were not meant for him, personally, but for the Ideals which he served.

His chief Ideal was a reduction in Maternal Mortality. How well he accomplished that can best be illustrated by noting the enviable record in his beloved Minnesota, and in the neighboring States where the force of his personality and teaching were so strikingly apparent.

When he retired as Head of the Department of Obstetrics and Gynecology at the University of Minnesota, he deserved a rest. But he did not take it! Instead, he seized the opportunity to personalize, even more, his teaching by countless visits to Committees on Maternal Welfare, small State Obstetric and Gynecologic Societies and State Medical Association meetings. Effective and forceful as he was upon the platform, it was to the informal groups, who always gathered about him on such occasions, that he talked most freely. Many in those groups were his "Boys". They had seen him lug "the

doll" into the amphitheater when, as undergraduates, he had taught them the mechanism of labor. They now came to him with obstetric problems far more serious, for this time more than a doll was involved, but he employed the same kindly, personal and helpful interest that is always the mark of a Great Teacher. Many a mother owes her life to those informal conferences just as, through his years of Professorship in Obstetrics and Gynecology, he saved so many by the sound fundamentals which he taught. And so another star was added to the firmament which already shone upon him!

There is but one more star to add to the galaxy which surrounds his memory. This one is the Star of Faith, present throughout his life and giving character to his words and deeds, but shining even more brightly to those who were privileged to see it more intimately as the shadows lengthened.

It was on a February night, not too many years ago. A heavy snow had blanketed East River Road and traffic had not yet churned it to slush. Even the traffic of one's mind was calm when Doctor Litzenberg arose slowly from his place by the open fire, walked to the window overlooking the road and, as though to himself, said, "and what doth the Lord require of thee, but to do justly, and to love mercy, and to walk humbly with thy God?"

The firmament is filled.

So when a great man dies,
For years beyond our ken,
The light he leaves behind him lies
Upon the paths of men. J. H. M.

FOUR STATE MEETING

The recent meeting of the four state obstetrical and gynecological societies held in Minneapolis in October brought forth many interesting comments from members and guests. There had been one similar meeting in 1945, also held in Minneapolis. Because of the favorable reaction to the first meeting generally held by those who attended, the plan was repeated.

When the Iowa, North Dakota and Wisconsin groups received their invitations, they were prompt in their replies and enthusiastic in their acceptance. Perhaps the most accurate assay of the general acceptance of the combined meeting idea was the high percentage of attendance of the four memberships. The four societies have a combined membership of 246. Forty-seven per cent of the total membership were present at the meeting. As might be expected because of the meeting's location, the Minnesota group had the highest actual and percentage membership attendance. It is noteworthy that the three out-of-state groups were also present in a high percentage of their memberships.

This favorable attendance prompted many to suggest some plan whereby this type of combined meeting might be repeated at regular intervals in the future. It is hoped that the subject will be discussed at future meetings of the four individual societies and concrete suggestions recorded for consideration later.

The general plan of having all groups participate equally seemed to have much in its favor. For one group to act as host, with the program being made up entirely by members of the host society, and with the other three groups being present only as guests would not seem to carry as much interest and it is doubted whether the attendance at such a meeting would be as high. The local arrangement committees were given splendid cooperation by the committees of the three out-of-state societies. This is the obvious reason for the good attendance and high degree of interest in the presentations.

JOHN A. HAUGEN

News Items

North Dakota

Speaker at a meeting of the Northwest District Medical Society in Minot in November was Dr. R. Ebert, heart specialist of the University of Minnesota Medical School, who discussed the diagnosis of heart conditions.

The meeting was held in conjunction with a dinner at Trinity Hospital dining room. Dr. Malcolm McCannel is president of the district society, and Dr. Henry Kermott is secretary.

Attending the meeting also was Forsyth Engebretson of Bismarck, executive secretary of the North Dakota State Medical Association, who was in Minot to make preliminary plans for the 1949 convention of the state association. The convention will be held in Minot and the dates are May 15, 16 and 17.

The Northwest group is to vote next month on the question of approval of the pre-payment medical plan put forward by the state medical society. The plan has been submitted to all district and local medical societies for their approval. The Northwest group will be the last district society to vote on it, officers said.

New honors have come to one of Bismarck's leading physicians and surgeons, Dr. Norvel O. Brink, 723 First Street, with his election to the International College of Surgeons. Dr. Brink has recently returned home from a trip to Fargo and St. Louis, Mo. In Fargo he attended meetings of the boards of directors of the Lutheran Hospital and Home Society and of the Jamestown Crippled Children's Hospital. He was made a member of the College of Surgeons at a convocation Friday evening in St. Louis.

Dr. G. A. Miners of Bemidji, Minnesota, has opened an office in Hettinger for the practice of medicine, according to a report given the Adams County Record. Dr. Miners, who is now director of the Minnesota Department of Health, will begin practice shortly after the first of the year.

Dr. Martin Hochhauser, Fargo physician and surgeon, has taken over the practice of Dr. E. C. Stucke, Garrison, North Dakota, who is retiring after serving this community faithfully the past 37 years. Dr. Hochhauser has been a resident physician at St. Luke's hospital in Fargo and was also on the staff of the Fargo Clinic.

Dr. T. W. Buckingham, Bismarck, was elected president of the Sixth District Medical Association at its December meeting, attended by about 35 doctors from this area and a few visiting doctors.

Also elected were Dr. Charles A. Arneson, Bismarck, vice president; Dr. C. H. Peters, Bismarck, secretary-treasurer, and Dr. M. Jacobson, Elgin, delegate to the state medical association's convention. Carry-over delegate to the state convention is Dr. Robert Radl, Bismarck. Re-elected to the association's board of censors was Dr. F. F. Griebenow, Bismarck.

Dr. Robert Schoregge and Dr. Gregory A. Dahlen, both of Bismarck, and Dr. W. Enders, Hazen, were elected to membership in the district association. Dr. Walter A. Craychee and Dr. Philip L. Blumenthal, both of Mandan, received their first reading of approval of membership following approval of their applications by the board of censors.

Scientific speaker at the dinner meeting was Dr. M. G. Fredricks, of the Duluth Clinic at Duluth, Minn., who spoke on "Treatment of Common Skin Disorders."

A number of Dickinson doctors were guests of the Eastern Montana Medical Society at a dinner and meeting held at Glendive, Montana, in December. Doctors attending from here were Dr. Paul Weir, Dr. H. E. Guloien, Dr. R. W. Rodgers, Dr. H. L. Wright, Dr. L. H. Reichert, Dr. D. J. Reichert and Dr. C. R. Dukart. Dr. Bernard G. Sarnet from the department of oral and facial maxillary surgery of the University of Chicago spoke on cancer of the head and face.

South Dakota

Dr. Paul Tschetter of Huron is the new president of the Fifth District Medical Society, having been elected at the organization's regular meeting in November. Other officers elected include: Dr. Harold Adams, vice-president; Dr. Ted Hohm, secretary-treasurer; Dr. R. A. Buchanan, delegate to state medical association convention; and Dr. B. T. Lenz, councillor. All are from Huron. David Buchanan talked on his impressions of socialized medicine in Norway and England, gained while he was a summer student at the University of Oslo.

Donald H. Breit, Sioux Falls, is the newly elected president of the South Dakota cancer commission. Other officers are Dr. A. C. Brock, Rapid City, vice president; Chester C. Lind, Watertown, secretary; Dr. Paul V. McCarthy, Aberdeen, executive chairman, and Mrs. Harry T. Dory, Watertown, state commander. Circuit Judge V. G. Wohlheter was re-elected treasurer.

Dr. David Brown, physician and surgeon, of Elk Point, has moved to Tyndall to practive.

Col. Howard W. K. Zellhoefer, faculty member of USAF school of aviation medicine at Randolph Field, Texas, has been appointed fellow of the International College of Surgeons at the recent annual meeting of the United States chapter, held in St. Louis, Missouri. Col. Zellhoefer is son of Mr. and Mrs. Guy W. Zellhoefer of Sioux Falls, where prior to entering the air force service he was surgeon of the Dakota Clinic.

Dr. Lyle Hare, Spearfish, was named by the American Medical Association as runnerup in the contest for "Family Doctor of the Year" at the convention held in St. Louis, Missouri.

Dr. Helen Jane Hare, daughter of Dr. Lyle Hare of Spearfish, is opening offices in Rapid City. The dermatologist, well known throughout the Black Hills, is coming here from Milwaukee, Wisconsin, to open her practice in the treatment of skin diseases.

Four representatives of the South Dakota State Medical Association attended national medical association meetings in St. Louis, Missouri. Dr. R. G. Mayer, Aberdeen, secretary of the association and editor of its Journal, headed the delegation attending the national conference on medical public relations, the national conference of medical secretaries and editors, and the interim session of the American Medical Association. Also at the meetings were John C. Foster, executive secretary of the state association, and Dale C. Whitcomb, assistant editor of the Journal, both of Sioux Falls, and Dr. H. Russell Brown, Watertown, South Dakota's delegate to the American Medical Association.

Minnesota

Dr. J. F. Weir was elected president of the staff of the Mayo Clinic at the annual meeting when three members who have reached retirement age were honored. Drs. M. S. Henderson, W. A. Plummer and Charles Sheard were honored upon reaching emeritus status. Other officers named include Dr. Della G. Drips, vice president; Dr. Edw. N. Cook, re-elected secretary.

Dr. Werner Ogden was named president-elect of the Ramsey County Medical Association at a recent meeting and will take office in 1950. Installed as president for 1949 was Dr. J. R. Aurelius. Other officers elected are Dr. Wm. A. Kennedy, vice president; Dr. Laurence Hilger, secretary-treasurer.

Election of officers and discussion of professional problems occupied the membership of the Blue Earth Valley Medical Society at its annual meeting in November. Dr. Robert Hunt of Fairmont was elected president of the association, which includes Faribault and Martin counties; Dr. Lewis Hanson of Frost was elected vice president; retiring president Dr. Mark Virnig of Wells was elected to the board of directors. Secretary-treasurer of the group is Dr. Herbert Boysen of Madelia.

Dr. Ralph Creighton, past president of the Hennepin County Medical Society, has been appointed to the board of directors of the Community Chest and Council.

Dr. Victor Johnson, Rochester, Minn., was named to a seven-man American Medical Association committee to survey American medical education.

The survey will seek to improve medical education; determine whether or not medical schools are turning out enough doctors and tell the public how medical education is working. The new survey will begin January 1 and will last three years.

Dr. Charles N. Hensel, a member of the Charles T. Miller hospital staff since the hospital opened in 1920, has been named chairman of the medical division of the Hospital building fund campaign.

Dr. P. F. Eckman has been renamed chairman of the Duluth Chamber of Commerce public health committee. A. W. King is vice president and A. W. Taylor, director chairman.

The appointment of Dr. Edward D. DeLamater, former Mayo Clinic staff member, as associate research professor in the department of dermatology and syphilology of the University of Pennsylvania was announced. He will act as director of research in the department and will develop a mycology laboratory. A graduate in 1942 of the Columbia University College of Physicians and Surgeons, Dr. DeLamater recently served here as Mayo Clinic consultant in mycology and Mayo Foundation assistant professor of bacteriology.

Dr. B. M. Spock of the Mayo Clinic staff received the second Mead Johnson award for outstanding contributions to pediatrics at the meeting of the American Academy of Pediatrics in Atlantic City. Dr. Spock is associate professor of psychiatry in the Mayo Foundation and consultant in psychiatry in the Mayo Clinic.

On December 6, 1948, Dr. Vernon L. Hart delivered the Annual Detroit Orthopedic Lecture. This lectureship was established in 1922 to "foster orthopedic surgery at large and in our midst." The lecture was delivered under the auspices of the Wayne County Medical Society. Dr. Hart presented a paper on "Congenital Dislocation of the Hip: Recognition and Treatment During Infancy Before Weight Bearing."

Dr. Clyde A. Undine, M.D., Minneapolis, attended the Regional Meeting of Illinois, Indiana, Michigan, Minnesota, and Wisconsin American College of Physicians at Detroit in November.

A. S. H. A. News

The American Student Health Association held their annual Council meeting on December 30 and 31 in San Francisco, California. It was decided that the name be changed from American Student Health Association to American College Health Association. It was further decided that the 1949 meeting should take place in December in New York City.

The new officers of the A.C.H.A. are as follows: President, L. B. Chenoweth, M.D., University of Cincinnati; President Elect, Irwin Sander, M.D., Wayne University; Vice President, Grace Hiller, M.D., Goucher College; Secretary-Treasurer, Edith Lindsay, Ph.D., University of California.

Kansas State College of Agriculture and Applied Science at Manhattan, Kansas, is in need of two full-time staff physicians. Apply to B. W. Lafene, Medical Director, Student Health Service.

The University of Colorado, Boulder, Colorado, is in need of one full-time staff physician. Apply to L. W. Holden, M.D., Director of Student Health Service.

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The JOURNAL LANCET

Minneapolis, Minnesota
February, 1949

Vol. LXIX, No. 2
New Series

Malignant Lesions of the Anal Canal

William C. Bernstein, M.D.

The anal canal is a structure which is lined by stratified squamous epithelium and extends from the anorectal line (pectinate line, dentate line or mucocutaneous junction) above to the anal verge below. The anal verge has been described by Buie as the line formed by the walls of the anal canal as they come in contact with each other at their external margin during their normal state of apposition. The anal canal varies in length in different individuals, the average canal measuring between one and one and a half inches.

The anal skin, sometimes referred to as *anoderm*, differs from ordinary skin on other parts of the body in that it contains no hair follicles and rarely contains sebaceous glands.

The need for all clinicians and investigators to adopt a uniform understanding of the true limits of the anal canal is extremely urgent since many articles have been appearing in recent literature indicating the lack of such an understanding. One author includes all tumors in the three centimeters above the anorectal line in his group of anal lesions while another includes perianal skin lesions under the heading of anal growths.

Malignant lesions of the anal canal are relatively rare but they do occur frequently enough to warrant more attention than has been accorded to this subject in the past. The importance of this region as a site of malignant tumors has been so overshadowed by the rectum and colon that one may be led to minimize symptoms of early lesions in this area.

Four cases of malignant disease of the anal canal have recently been observed by the author. Two of these patients have been seen at the University Hospitals and two in private practice.

Incidence

Various clinics have reported on the incidence of malignant tumors of the anal canal and from available information it appears that the incidence is somewhere between 3 and 5 per cent of all cancer of the rectum. It has not been possible to determine accurately in given papers whether the figures have been for cancer of the rectum alone or for the entire colon.

Lahey Clinic	1.7%	600 cases
Bacon, Linde, Murray	3.0%	472 "
Gazetta and Cole	4.0%	100 "
Lawrence	3.3%	635 "
Mayo Clinic	1.73%	2,939 "
Kaplan & Rubenfeld	4.6%	— "
University of Minnesota	2.8%	214 "

There were 214 cases of cancer of the rectum (figured at 13 cm. and below) at the University of Minnesota Hospitals from January 1942 through June 1947. Of this number there were six proven cases of anal carcinoma, three of which were inoperable when first seen.*

Diagnosis

Early malignant lesions of the anal canal are diagnosed by either a thorough and painstaking investigation of the anal canal or by microscopic section of tissues removed at surgical operations on this region. There are no set symptoms that one can use as a guide specifically

*Unpublished data of Dr. Robert Toon.

for cancer of the anal canal. Unfortunately the symptoms of this disease may be exactly the same as those which accompany many benign conditions such as hemorrhoids, fissure, pruritus ani, perianal fistula, etc. These ordinary anal affections are usually so benign in their early eymptoms and so chronic in their course that it is extremely easy to permit early malignant lesions to progress to far advanced stages insofar as curability is concerned before an accurate diagnosis is made. The usual anal and rectal complaints of bleeding, pain, protrusion, discharge and itching must be regarded as significant in every patient and must suggest the possible presence of a malignant tumor until a thorough examination has proven the benignancy of the condition.

Malignant lesions which affect the anal canal may be situated either inside or outside the body cavity. If the tumor is external to the anal aperture it may be entirely visible without the use of scopes and may resemble some type of skin lesion. On the other hand the tumor may be entirely confined within the sphincter area and can be exposed only through the anoscope or proctoscope. External inspection, palpation and digital examination are not sufficient to rule out early lesions in the anal canal. Complete visualization of the entire canal combined with biopsy of suspicious lesions must be carried out to insure a high degree of accuracy in diagnosis.

For many years it has been felt that benign lesions of the anal canal may be significant factors in the production of malignant tumors. In 1931 Rosser published a paper in which he stressed the importance of the benign lesions, notably perianal fistulae, as precursors of anal carcinoma. Seven of his thirteen cases of anal carcinoma began in patients who had pre-existing fistulae. The remainder were associated with hemorrhoids, cryptitis and papillitis. Subsequent investigators, namely Buie and Brust, Tucker and Hellwig, Drueck and others have noted a similar relationship.

Buie, Fansler and others have repeatedly stressed the responsibility of the physician who is called upon to advise patients with benign anal lesions. Patients afflicted with hemorrhoids, fissure, fistulae and other benign conditions of the anorectal region usually inquire if there is danger in procrastinating before undergoing surgery. In the light of existing information as regards fistulae in particular, the evidence would point to the fact that a definite danger does exist in untreated perianal and perirectal fistulae. Binkley and Derrick have pointed out that the incidence of anal cancer in patients with chronic anal manifestations of lumphopathea venereum suggest that the latter disease may be a predisposing factor in the genesis of this type of cancer. They suggest that all patients with anal manifestations of lymphopathea venereum be examined by means of skin biopsy for squamous cell carcinoma.

Assuming the investigations mentioned above to be significant, it is quite logical to assume, therefore, that all benign lesions removed in the operating room should be examined microscopically. Only by such a program can early malignant lesions be detected in otherwise benign-looking specimens. Tucker and Hellwig found 1.9 per cent of unsuspected tumors in tissues from 951 anorectal operations for benign lesions.

One of the cases to be reported in this paper was recently diagnosed at St. Joseph's Hospital in St. Paul. Sections of some very large hemorrhoidal specimens revealed the presence of a lymphosarcoma which had not been suspected.

TYPES OF TUMOR

1. Squamous cell epithelioma (epidermoid carcinoma)
2. Adenocarcinoma
3. Basal cell epithelioma
4. Lymphosarcoma
5. Melanoepithelioma
6. Hemangioendothelioma
7. Bowen's disease

1. The *squamous cell epithelioma* or epidermoid carcinoma is by far the most frequent malignant tumor affecting the anal canal. In the series of 51 cases reported by Buie and Brust there were 43 squamous cell carcinomas. These tumors may have the same appearance as do squamous cell epitheliomas on the other parts of the body or they may simulate a hemorrhoid, fissure, fistula, venereal wart or other type of anorectal lesion. The lesions may be ulcerated or they may be hard and nodular.

This type of lesion seems to affect more women than men and the disease has its highest incidence in the fifth decade of life.

The microscopic sections of squamous cell epithelioma of the anal canal are not particularly significant in any respect except that there are wide variations in the histologic appearance of the tumors, varying from the uniform type of cells to the completely undifferentiated types of tumors. A high percentage of these tumors are in the grade three and four classifications.

2. *Adenocarcinomas* of the anal canal do not arise from the covering of the canal itself but invade the anal wall either from the mucous membrane just above the anorectal line or extension from an anal duct gland or other glandular structure which may be contained within or deep to the anal wall itself. As stated above, the anal skin does not usually contain sebaceous or apocrine glands but, when it does, malignant lesions of these glands may develop. Scarborough has reported a primary adenocarcinoma of an anal gland which metastasized to the brain. A case of adenocarcinoma of the anal canal will be reported in this paper.

3. *Basal cell epitheliomas* of the anal canal have been reported by several authors. It is, however, a relatively rare tumor and probably somewhat less malignant than the squamous cell carcinoma. Bell states that basal cell and squamous cell carcinomas are associated in about 10 per cent of the cases and when both basal cell and squamous cell features are present the tumor generally follows the clinical course of the more malignant squamous cell type.

In the records of 150,000 biopsies at the State Institute for Malignant Disease as reported by Lawrence

there were no cases of basal cell cancer of the anal canal. Buie and Brust reported 2 cases in their series of 51 malignant tumors of the anal canal while Lawrence reported 2 cases from the records of the Pondville Hospital, Wrenthan, Massachusetts, an institution for persons with cancer, where 17,462 patients were treated in 13 years. In this series there were 635 cases of carcinoma of the anal canal and rectum. Of this group 21 or 3.3 per cent were classified as primary anal carcinoma. There were 15 squamous cell epitheliomas, 4 adenocarcinomas and 2 basal cell epitheliomas. One case of basal cell epithelioma will be reported in this paper.

4. *Lymphosarcoma.* This type of tumor is extremely rare in the anal canal. Sarcomas of any type are found in exceedingly small numbers in any part of the large bowel. Drueck has reported a case of a highly undifferentiated sarcoma of the anal canal in a boy five years of age. The case which is presented here is an early lymphosarcoma in the hemorrhoids removed from a 45 year old female.*

5. *Melanoepithelioma.*

6. *Hemangioendothelioma.* Cases representing types 5 and 6 have been reported in the literature. Their occurrence is, however, extremely rare.

7. *Bowen's Disease.* This is a condition which may occur on either skin or mucous membrane. In 1941 Freund reported a case and states that Bowen's disease attacks the anal region occasionally and differs from Paget's disease and other precancerous lesions. The disease produces metastases in lymph nodes and distant organs. The histologic picture resembles the epithelial overgrowth seen in animals receiving inunctions of tar products.

Case Histories

Case 1. White male, age 82. This patient presented himself for treatment because of acute, knife-like pain on defecation. There was no history of bleeding, protrusion, weight loss or other symptoms of serious moment. On examination a very painful, raised area was encountered on the upper margin of the right anal wall. The patient chose to go elsewhere for a local excision of his tumor and this was done. He expired suddenly on the second postoperative day. Microscopic sections revealed a basal cell epithelioma of the anal canal.

Case 2. White female, age 45. This patient presented herself for examination because of rectal bleeding. Her physician found large interno-external hemorrhoids. He performed a hemorrhoidectomy and the tissue was sent to the pathologic laboratory. Microscopic sections revealed the presence of unsuspected lymphosarcoma of the anal canal.

Case 3. White female, age 81. This patient had had pain on defecation and bleeding for three years. She was examined by her local physician, who found a tumor of the anal canal and referred her to the University Hospital for treatment. Nodes were found in her inguinal regions but because of her general condition a local resection of the lower end of her rectum only was performed. Microscopic section of the tumor showed it to be a squamous cell epithelioma.

Case 4. White male, age 70. This man stated that he had had pain and the feeling of a mass in the rectum for the past two years. He is a chronic alcoholic and is not too interested in his own welfare. So far he has not submitted to treatment. Biopsy of the tumor revealed the presence of adenocarcinoma of the anal wall.

Metastasis in Anal Cancer

Although cancer of the anal canal is, in many respects, an external form of cancer, it has been a most discouraging type of tumor to treat because of the obscure and bizarre patterns which the metastases follow. Until recent years the metastatic spread of this disease was not too well understood. Methods of treatment in vogue a few years ago were entirely inadequate, in the light of our present knowledge of the spread of this type of tumor. Because the lymphatic drainage of the anal canal may be either to the inguinal nodes which are reached by lymphatic vessels which pass forward from the anus on either side in the fold between the thigh and perineum, or to the nodes in the ischiorectal fossae, or to those in the rectum and perirectal chains, the assumption must be made in every case that all methods of spread may have taken place, regardless of the external appearance of the tumor.

These tumors also spread by direct extension and by involvement of the blood vessels. Metastases to the liver are, however, rare in cancer of the anal canal. Cattell and Williams state that in 200 cases collected from the literature, metastases to the liver was noted in only 2 cases.

The lymphatic spread of the disease is very common and has been well described by Keyes. He states that carcinoma of the anal canal follows the description of the downward and lateral spread of Miles and that the upward spread of Miles is rarely seen. The downward spread consists of the perianal skin, the sphincter ani muscle and the ischiorectal fat. The lateral spread refers to the levator ani and coccygeal muscles, the pelvic peritoneum, the prostate gland, the base of the urinary bladder, the cervix uteri and the base of the broad ligament. Keyes pointed out that in his cases there was no involvement of the rectorectal (lowermost mesocolic nodes), the pelvic mesocolon, the pericolic nodes, the nodes about the bifurcation of the left common iliac artery and the aortic nodes. In his series of 27 cases of anal carcinoma, Keys found inguinal metastases in 4 cases and some type of metastases in 19 or 70 per cent of his series. Failure of clinicians to recognize the exact pattern that metastases may take, coupled with the willingness to assume that absence of visible metastases is sufficient indication for conservative therapy, is the most plausible reason for the high recurrence rate for this disease.

Baronofsky has called attention to the free anastomosis which exists between the lymphatic vessels which drain the anal canal, perineum and genital organs and

*Reported by the courtesy and permission of Dr. H. R. Tregilgas.

stresses the importance of bilateral dissections of the inguinal lymphatics for malignant lesions in these areas.

The inguinal nodes may be enlarged from inflammatory disease alone, but on the other hand, metastatic carcinoma may be preesnt in the nodes before actual enlargement has taken place. The nodes in the deeper tissues cannot be seen nor felt until marked enlargement has taken place. For these reasons it must be assumed in every case of cancer of the anal canal, regardless of how early the lesion may appear, that extension of the process through the lymphatic channels has taken place.

TREATMENT

A review of the literature of the past 20 years reveals the fact that the treatment of anal malignancies has been carried out in a haphazard, hit and miss, and entirely inadequate manner and has resulted in a five-year survival rate which is much lower than that for cancer in other parts of the large bowel. In spite of the admonition of Miles in 1931, we are just today beginning to assume the rational approach towards anal malignancies that malignant lesions in any location require, namely, a radical dissection and removal of the tumor bearing area and the avenues of spread. It is rather shocking, in the light of our present knowledge, to read statements to the effect that early lesions should be treated conservatively, that inguinal nodes should not be removed until they become enlarged, and that X-ray or radium should be given a trial before resorting to radical surgery.

There are several groups in this country who are of the opinion that irradiation therapy is still the treatment of choice. Meland, writing in the *American Journal of Roentgenology* reports 6 patients still alive in 1947 out of a group of 13 patients treated with X-ray and radium in 1939. He states that there is a high degree of sphincter incontinence due to anal atresia, radionecrosis, etc., but feels that a poor anus is better than a colostomy. His optimism towards this type of treatment does not seem to be shared by others.

Richard Sweet reported a 17.3 per cent five-year survival rate and states that irradiation therapy is not as satisfactory as radical excision either as a method of cure or as an attempt to secure relief from the distressing local symptoms of epidermoid carcinoma of the anal canal.

Kaplan and Rubenfeld feel that the treatment of anal malignancies should begin with irradiation of the inguinal lymphatics and the local area of involvement. Surgery can then be left to the judgment of the operator.

Stenstrom feels that radical surgery should be performed on all operable lesions and that irradiation therapy may or may not be used subsequently, depending upon the judgment of the clinicians.

Wangensteen has employed the radical approach suggested in this paper on several patients who are alive and well after six years.

As has been pointed out above, the five-year survival rate for anal malignancies has been much lower than that for lesions in other parts of the large bowel, despite the fact that one would expect anal lesions to be diagnosed at an earlier stage. This situation must, of necessity, be explained on the basis of the types of treatment which have been carried out. It is our belief that if the same radical approach to anal cancer is carried out as is done for carcinoma elsewhere that the curability rate for this disease will be just as acceptable.

Considering the avenues of spread of anal carcinoma it is logical to suggest that no operative attack short of a radical Miles abdominoperineal excision of the anal canal, rectum and pelvic colon, together with the structures adjacent to the anal canal followed by a radical excision of the inguinal lymphatics is an adequate curative procedure.

This method of treatment must, of course, be reserved for those patients who are not too far advanced in the course of the disease and who are proper surgical risks. Emphatic, however, is the suggestion that this form of treatment is the procedure of choice for the apparently early and local tumors. Experience has proved that inguinal node metastases may appear long after the local lesion has been removed and the absence of enlarged inguinal nodes is no assurance that the disease will not appear at a future date.

In 1931 Miles stressed exactly what he meant by a radical abdominoperineal operation and it would be well for many surgeons to read his description of the operation. Miles stated as follows: "By this means the whole of the pelvic colon (with the exception of the portion to be utilized for colostomy), together with the whole of the rectum encased in its sheath of fascia propria; the whole of the pelvic mesocolon; the peritoneum lining the floor as well as the walls of the true pelvis; the whole of the levator ani and coccygeus muscles; the external sphincter muscle; as much as possible of the ischiorectal fat and a wide area of perianal skin, are removed." Miles states further: "Although the operation is comprehensive in its aim, it should not be reserved for advanced cases only. It should be the procedure of choice for early cases; in fact the earlier the better, because then we may hope to circumvent the invisible spread of the disease. Should it be reserved for advanced cases only, as advocated by some, then the invisible spread will have advanced beyond the confines of the operative field and recurrence will be inevitable."

SUMMARY AND CONCLUSIONS

1. Between 3 and 5 per cent of all malignancies situated below the rectosigmoid junction have their origin in the anal canal.

2. Cancer of the anal canal should always be kept in mind when a patient presents symptoms referable to the anal canal.

3. Metastases from anal lesions may involve the inguinal lymphatics in addition to all other structures which are involved in any other low-lying rectal lesion.

4. Radical surgical treatment must be carried out early in cancer of the anal canal if recovery statistics are to be improved. A radical Miles abdominoperineal operation followed by bilateral excision of the inguinal lymphatics

is the treatment of choice. Conservative therapy must be limited to those patients who are not proper surgical risks and to those in whom the disease has progressed to the inoperable stage.

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POSTGRADUATE FELLOWSHIPS ANNOUNCED

Postgraduate fellowships in the fields of research, physical medicine, and public health are now available through the National Foundation for Infantile Paralysis. Application may be made to the Foundation at 120 Broadway, New York 5, New York, at any time during the year. Selection of candidates will be made on a competitive basis by committees composed of specialists in each field. Awards are based on the individual need of each applicant.

Research fellowships are available in virology, orthopedic surgery, pediatrics, epidemiology, and neurology. These fellowships are intended to emphasize advanced training in the basic sciences as they apply to the particular specialty and to research, and experience in research, which need not be immediately related to poliomyelitis.

In physical medicine, clinical fellowships are available for physicians who wish to prepare for eligibility for certification by the American Board of Physical Medicine. Public health fellowships are available to physicians for one year of postgraduate study leading to a Master of Public Health degree at a school of public health approved by the American Public Health Association. Further information may be obtained from the Foundation.

POSTGRADUATE COURSE IN DISEASES OF THE CHEST

The Council on Postgraduate Medical Education of the American College of Chest Physicians and the Laennec Society of Philadelphia announce a Postgraduate Course in Diseases of the Chest to be held at the Warwick Hotel, Philadelphia, Pennsylvania, February 28 through March 5, 1949. This course will emphasize the recent developments in all aspects of diagnosis and treatment of diseases of the chest.

The course is open to all physicians, although the number of registrants will be limited. Applications will be accepted in the order in which they are received. The tuition fee is $50.

Application may be made through the Executive Offices of the American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

Wolff-Parkinson-White Syndrome

Report of Two Cases

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Lawrence, Kansas

WOLFF, Parkinson and White[1] in 1930 reported a series of cases of healthy young people without demonstrable heart disease who were found to have short PR intervals and prolonged QRS complexes on their electrocardiograms. A tendency to attacks of paroxysmal tachycardia was noted in this group of patients; however, the prognosis of this condition was generally considered to be good.

During the past ten years increasing evidence has accumulated in the literature to show that the Wolff-Parkinson-White syndrome is not such a benign condition as it was previously thought to be. Several authors[2–8] have reported cases of paroxysmal ventricular tachycardia occurring in patients with the Wolff-Parkinson-White syndrome. Paroxysmal ventricular tachycardia is a dangerous condition which seldom occurs in the absence of severe heart disease. At least eight deaths of a cardiac type have been reported[9–14] in patients known to have the Wolff-Parkinson-White syndrome. Most of these deaths were the result of repeated or prolonged attacks of paroxysmal tachycardia.

In this paper two additional cases of the Wolff-Parkinson-White syndrome are reported. One of these patients was shown to have an attack of paroxysmal ventricular tachycardia. The other patient died a cardiac type of death probably as the result of an attack of paroxysmal tachycardia.

CASE REPORTS

Case 1. A white male patient, age 26, was admitted to the hospital at 1:00 P.M., March 29, 1946, complaining of palpitation, "light-headedness," and nausea. The attack had started suddenly the previous evening after the patient had run about fifty yards. At the onset he

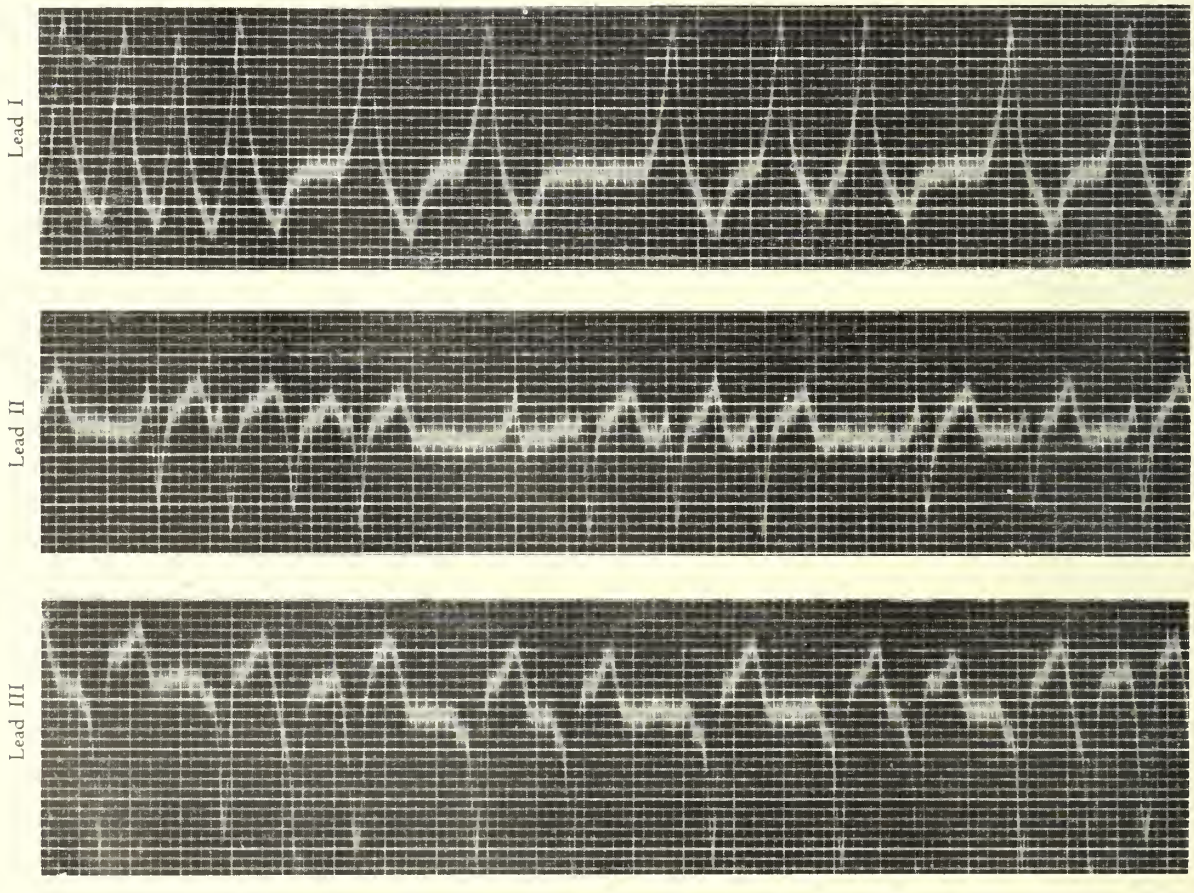


Fig. 1. An electrocardiogram taken on Case 1 during an attack of paroxysmal ventricular tachycardia March 29, 1946.

nearly fainted, however, his symptoms abated to the extent that he was able to carry on until shortly before admission when the palpitation, dizziness and nausea again became quite severe.

The patient had suffered a similar attack lasting only a few minutes in February 1943. This first attack came on after running a short distance. In November 1944 he suffered a second attack about two hours in duration.

Review of the patient's past medical history revealed that he was supposed to have had rheumatic fever at the age of twelve, but no detailed account of his findings at that time could be given. He had been under medical observation from 1938 to 1940 because of an early minimal tuberculosis in the apex of the right lung. This lesion had become calcified and apparently stable by February 1940. The patient had been a conscientious objector during World War II. He had served for thirty-two months as an experimental subject for studies on the effects of high altitude, and later for experiments on thiamin and riboflavin deficiencies. After his discharge from conscientious objector camp in April 1945 the patient suffered frequent attacks of palpitation, but had never experienced an attack as severe or prolonged as the one described in this paper.

Physical examination on admission revealed a young male adult who was pale and apprehensive, but not cyanotic. Examination of the lungs was negative. The pulse was totally irregular averaging 80 to 85 at the radial artery and the apex. There was no pulse deficit. The blood pressure was 135 systolic and 80 diastolic. The P.M.I. was found in the fifth left interspace in the mid-clavicular line. No murmurs were heard on auscultation.

An X-ray film of the chest showed the heart to be within normal limits in contour and size.

Shortly after admission to the hospital, an electrocardiogram was made on the patient (figure 1). Within a few minutes of this time the pulse rate suddenly became regular and the patient's symptoms subsided. No treatment was administered other than bed rest and mild sedation for a period of three days after which he was dismissed free of symptoms.

An electrocardiogram taken during the paroxysm is shown in figure 1. The ventricular rhythm is totally irregular with an average rate of about 140. The QRS complexes are markedly distorted, widened and slurred, and show considerable variation in form. The P waves are difficult to identify, but seem to occur independently of the ventricular complexes. This tracing is considered to be typical of paroxysmal ventricular tachycardia. In figure 2 are shown some electrocardiograms made on the patient one year prior to this attack. Tracings were taken before and immediately after exercise. In the electrocardiogram taken before exercise there is a PR interval of 0.08 second with a QRS interval of 0.12 second in Lead I. The PR interval is 0.10 second in Lead III

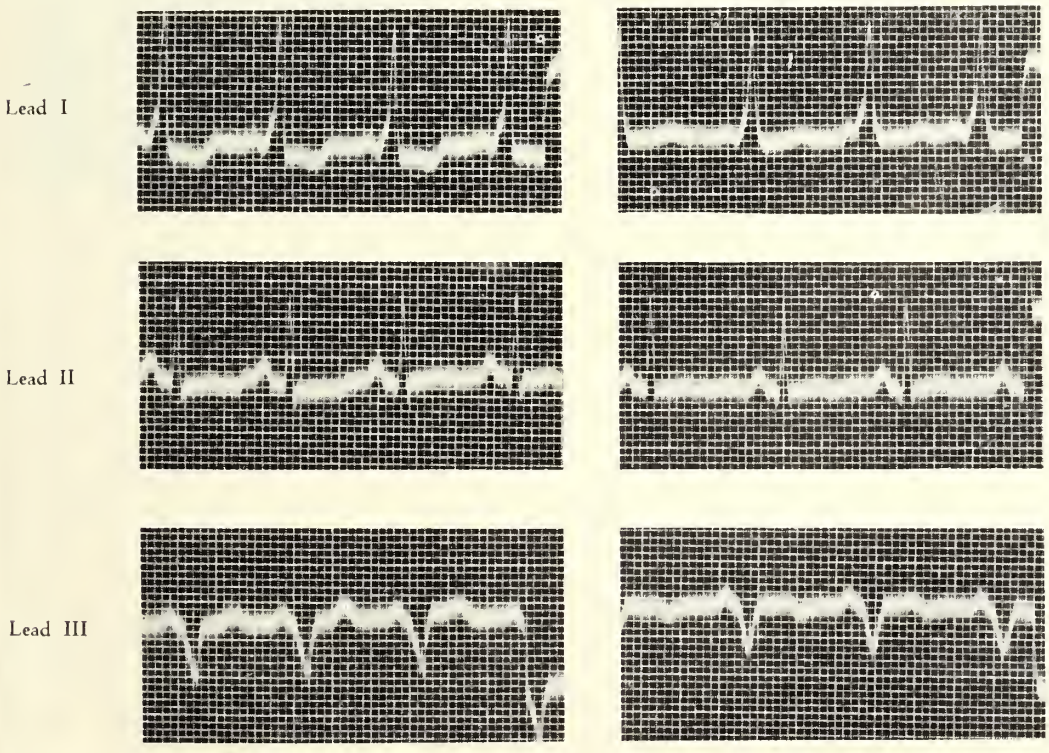


Fig. 2. The electrocardiograms shown here were made on Case 1, April 3, 1945, about one year prior to the paroxysm of ventricular tachycardia shown in figure 1. The tracings on the left were taken before exercise, and those on the right were made immediately after exercise.

and the QRS interval is 0.12 second. The RT_1 segment is depressed and T_1 is inverted. There is little change seen in the tracing taken immediately after exercise. The short PR intervals and prolonged QRS complexes persist in Leads I and III. The RT_1 segment is no longer depressed and T_1 has become upright. Both of the tracings shown in figure 2 are considered to be typical examples of the Wolff-Parkinson-White syndrome.

Case 2. This 23 year old white male student was first admitted to the hospital at 1:00 A.M., February 18, 1945, complaining of rapid heart action and nausea which had started suddenly thirty minutes prior to admission. The patient had attended a fraternity dance for several hours immediately preceding the onset of his symptoms.

The patient stated that he had suffered a similar attack while serving in the Army in March 1944. At that time a diagnosis of paroxysmal tachycardia was made and he was given a medical discharge from the Army. There was no past history of rheumatic fever or of any severe illness which might have damaged the heart.

Physical examination on admission showed a pale, perspiring young man who was quite nauseated and during the examination vomited once. There were no remarkable findings in the lungs. The pulse was irregular and varied in rate from 140 to 160. The blood pressure was 118 systolic and 88 diastolic. The P.M.I. was visible in the fifth left interspace in the mid-clavicular line. No murmurs were noted either during the attack or afterward.

The attack ceased suddenly about three hours after its onset. Prior to this the patient had vomited at intervals of ten to thirty minutes. The pulse slowed to 80 and the rhythm became regular. The nausea and vomiting subsided and the exhausted patient fell into a deep sleep. After a rest of three days, he was dismissed from the hospital with no complaints.

An electrocardiogram made on the patient one month after the first admission is shown in figure 3. The auricular and ventricular rates are 62. The PR interval is 0.10 second and the QRS interval is 0.12 second. This tracing fulfills the criteria necessary for the diagnosis of Wolff-Parkinson-White syndrome.

The patient was admitted to the hospital a second time on September 13, 1945, at 2:30 A.M., complaining of palpitation and weakness. He was not nauseated on this occasion. The pulse was somewhat irregular and the rate was about 140. There were no other remarkable physical findings. The attack subsided suddenly about two hours after admission at which time the pulse rate became 60. The patient left the hospital at 11:30 A.M. the same day without a dismissal order from his physician.

On November 24, 1945, the patient died suddenly during an attack of rapid heart action. A description of this terminal episode was obtained from the patient's father. The attack had started suddenly with rapid heart action, weakness and extreme nausea while the patient was attending a football game. The patient left the stadium, returned to his home, and went to bed. His parents found him there about three hours later. At that time he was still complaining of severe palpitation, and was quite weak and nauseated. He vomited or attempted to do so every few minutes. Suddenly he threw back his head, gasped, and was dead. A physician had not seen the patient. An autopsy was not performed.

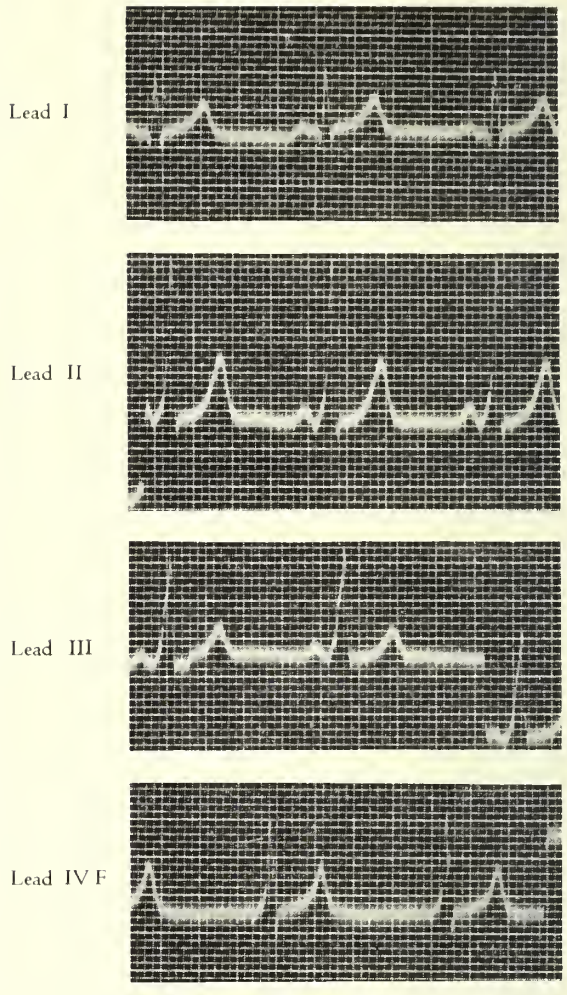


Fig. 3. An electrocardiogram made on Case 2 on March 19, 1945.

From the description of this terminal attack, it would appear that the immediate cause of death was paroxysmal tachycardia.

SUMMARY

Two cases of the Wolff-Parkinson-White syndrome are reported. The first case was seen during an attack of paroxysmal ventricular tachycardia. The second case died during what apparently was an attack of paroxysmal tachycardia.

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DIGEST REPORTS UNIVERSITY OF MINNESOTA WORK ON UNDULANT FEVER

The success of University of Minnesota medical scientists in working out an effective treatment for human brucellosis (undulant fever) is reported by Paul de Kruif, author of *Microbe Hunters,* in the January issue of *The Reader's Digest.* In the article, "Undulant Fever — Cause and Promising Cure," de Kruif tells how the Minnesota scientists, headed by Dr. Wesley W. Spink, professor of medicine, learned that the combined use of streptomycin and sulfadiazine would cure undulant fever sufferers.

The writer also relates Dr. Spink's success with a new drug, aureomycin, in treating brucellosis patients in Mexico last summer when he served as a consultant in Mexico's undulant fever control program.

CANCER DETECTION CLINIC

More than half of the 292 persons examined by physicians at the cancer detection clinic held in St. Cloud in December, 1948, were found to be in need of medical care. A total of 166 persons were advised to obtain further examination and treatment from their own physicians. The one-day detection clinic at St. Cloud was sponsored by the Stearns-Benton County Medical Society, the Cancer Committee of the State Medical Society, and the Minnesota Division of the American Cancer Society.

Cancerous or precancerous conditions were found in 38 of the persons examined. Other conditions included 17 cases of hypertension, 13 cases of keratosis, 5 or more cases of cystocele, cervical polyp, and cervical erosion, and 3 or more cases of umbilical mass, hemorrhoids, lipoma of the chest, rectocele, cervical ulceration or laceration, vaginal discharge, and vaginitis.

Females examined numbered 213, males 79. Ages ranged from 20 to over 70. There were 17 different nationalities represented.

Medical Group Practice in the United States: V. Growth of Groups[1]

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U. S. Public Health Service

THE individual physician in his day by day practice undoubtedly plays a vital part in maintaining the public health. On his proper diagnoses of infectious diseases and the quarantine of the patients concerned may depend the safety of the community at large. In terms of persons involved, the aggregate of patients seen during a year by the practicing physicians of a community probably includes the major proportion of its population. Other examples of the public health role of the ordinary physician could be cited. Any mode of practice, therefore, that might make medicine generally more effective would seem to merit consideration as a public health measure.

Group practice,[2] especially in instances where both diagnostic and therapeutic services are offered, has increasingly come to be recognized as, potentially, at least, a mechanism for providing highly effective medical care. This fact is attested by the unanimous endorsement of the group practice principle by the National Health Assembly of 1948 (8) and perhaps by the accelerated development of medical groups in recent years (3). An estimation of the stability of this form of medical practice therefore should be of specific interest. The present report attempts such an estimate based on the longevity and growth in staff members of a fairly large proportion of existing groups. Related questions such as the number of physicians leaving a group and the kinds of vacancies in groups are also examined.

A complete discussion of the growth of medical group practice would require information on all groups within a given period of time, disbanded groups as well as those which have survived. Available data on disbanded groups, however, are scanty and mostly indirect, and the discussion is largely limited to consideration of surviving groups as represented by the present sample.

Previous quantitative information on the age of medical groups in the United States is limited to that provided by Rorem in 1931 (5) and the reports of the Bureau of Medical Economics of the American Medical Association in 1933 and 1940 (6, 7). These papers, and one of the present series (3), also consider numerical increase of medical groups in the United States as well as size of staff.

Present Material

Ninety-eight medical groups in existence during 1947 are represented in the present sample, although not with regard to every item considered.[3] The sampling plan employed in locating the group was to have a member of the survey staff visit most of the known groups within a reasonable distance of the main routes of his travel in 21 states. The sample thus obtained is about one-fourth of all the known medical groups in the country as of mid-1946 (3). It varies from the latter in (a) comprising a higher proportion of groups from the West South Central region of the country and a lower representation of the Mountain and Pacific states, and (b) having a greater proportion of large groups (36 per cent compared with 20 per cent).[4] The sample resembles all the known groups of 1946 in relative number of the various types of group organization represented.[5]

Longevity of Groups

Disbanded groups. The Bureau of Medical Economics of the American Medical Association (7) estimated that "approximately 42 per cent of the 239 groups studied (by them) in 1932 had disappeared or ceased to operate as groups during the succeeding eight years." A more recent questionnaire survey (3) found that somewhere between 20 and 32 per cent of groups listed by the Bureau of Medical Economics in 1940 were apparently no longer medical groups in 1946. The group mortality during the latter period was undoubtedly influenced by war conditions. The reasons for dissolution of former groups, as remarked in many of the returned questionnaires, were mainly retirement or death of a physician in the group (presumably very small groups or single owner groups), and "scarcity of younger physicians" in civilian practice.

Other evidence of the rate of group mortality is suggested by the data of Rorem (5) who lists the 55 organizations included in his study. Questionnaires were sent to 47 of these medical groups in a 1946 survey by

[1] This is the fifth of a series of studies on medical group practice from the Division of Public Health Methods (1, 2, 3, 4).

[2] As defined, a medical group is a formal association of three or more physicians providing services in more than one medical field or specialty, with income from medical practice pooled and redistributed to the members according to some pre-arranged plan. For a full discussion of the attributes of a medical group, the reader may be referred to the first study of the series (1).

[3] The survey covered the latter months of 1946 and most of 1947, but only the date 1947 is used for the sake of convenience.

[4] Size of group, unless otherwise specified, refers to number of full-time physicians. The definitions are: small group, three to five physicians; medium group, six to ten physicians; large group, eleven or more physicians. On occasion, the first two categories are combined and referred to as smaller groups.

[5] A definition and discussion of the several types of groups is given in the first paper of the series (1).

Table 1
Distribution of 98 Medical Groups by Date of Organization

Total Number	Mean Age (years)	Date of Organization[1]						
		Before 1919	1919-1923	1924-1928	1929-1933	1934-1938	1939-1943	1944-1947
		Number of Medical Groups						
98	19.9	23	18	14	9	19	10	5

[1]Date of organization refers to time when 3 or more full-time physicians practiced as a group. Only about the first 8 months of 1947 are taken into account in the last interval.

Hunt and Goldstein (3) and 45 replies were received. Of the latter, 4 stated the group had disbanded, and 1 claimed to be an informal group.[6] Thus at least 85 per cent of 47 clinics listed by Rorem in 1930 were still active some 17 years later.

Surviving groups. Table 1 gives the date of origin and mean age of the 98 practicing medical groups.[7] These groups have been in existence an average of 20 years. Nearly a fourth of the total number were organized 30 or more years ago, the oldest in 1904. Many of the groups were founded as two-man teams before the date when they were organized as a group of three or more full-time physicians.

The distribution of the groups by date of organization, as shown in Table 1, suggests special activity in group formation during 1919-1923 and 1934-1938, and a low point in the organization of new groups in 1929-1933. This phenomenon was also noted in the 1940 report of the Bureau of Medical Economics (7). It must be remembered, however, that these trends refer to surviving groups only; there is no record, certainly no complete one, of groups disbanded during these periods. Some groups may have organized during the early part of 1929-1933, for example, and dissolved within the same period, perhaps because of the acute economic depression. The comparatively small number of groups founded in 1939-1947, according to the present sample, is probably a reflection of war conditions.

With regard to type of group organization, the numerical representation of all except the partnership groups is in each case too small for detailed consideration and hence the average age of each (except the partnership groups) can be no more than suggestive. The mean age of 81 partnership groups was 19.7 years; of 7 single owner groups, 18.1 years; of 4 voluntary nonprofit hospital groups, 28.2 years; of 3 industrial groups, 24.7 years; and of 3 cooperative consumer groups, 14.7 years.

Medical group practice is undoubtedly an older phenomenon in certain parts of the country than in others. Here too, however, the sample is too small for elaboration. All that may fairly be said is that individual groups have been in operation in most, if not all, major regional divisions of the country over a period of at least 20 years.

Table 2 relates age and present size of the group to the size of the community in which the group is located. According to the present sample, groups in communities of less than 10,000 population seem to be on the average definitely smaller in size than those in cities of 10,000 or more, and correspondingly, the average age of groups in the very small communities is considerably less than that of existing groups in cities of 10,000 or more population. Figure 1 illustrates the general relationship between age and size of group and size of community.

Table 2
Age and Size of Medical Groups in 1947 in Relation to Size of Community

Population of Community in which group was located	Number	Mean Age (years)	Mean Size (full-time physicians)
Less than 10,000	30	13.4	6.2
10,000 to 25,000	20	22.2	11.0
25,000 to 50,000	21	22.9	10.2
50,000 to 100,000	12	24.3	12.7
100,000 and over	15	21.5	16.3

A possible explanation of these relationships may be that small communities generally can support only small groups of 3 or 4 members. Such small groups, in turn, would be likely to dissolve if even one member died or retired. Any new group formed in the same community and still in operation would of course show a shorter life-span when compared with large groups which might lose several physicians without having the group disband.

Groups comprising only 3 or 4 physicians were found in the following ratios to all groups in the different sized communities: 13 of 30 groups in towns of less than 10,000; 6 of 41 groups in communities of 10,000 to 50,000; and only 2 of 27 groups in cities of 50,000 or over.

[6]An informal group is one in which the members share office space and possibly secretarial and other personnel overhead, but in all other respects practice as individuals (1).

[7]The median in the present instance, and throughout, has been essentially like the corresponding mean, and hence the latter only is used unless otherwise specified.

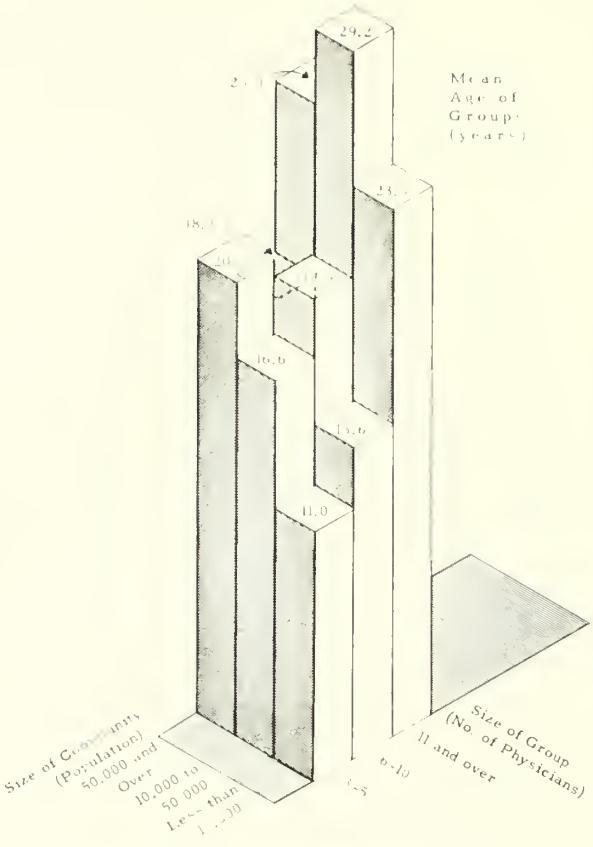


Fig. 1. Relationship between age of a sample of existing groups and size of community and size of group.

group was, on the average, remarkably constant, ranging from 3.7 to 4.5 throughout the period under consideration. Further, and as might have been expected, the oldest groups, i. e., those organized before 1919, show the greatest average increase in medical staff, from 4 to 14 full-time physicians.

The mean size of the 81 groups was 4.2 physicians when initially formed, and 9.0 physicians in 1947. Of the total number, 82 per cent show an increase in size since their initial formation, some having grown to a great extent; one group had increased from 5 to 52 physicians. Some 11 per cent of the groups had the same number of physicians at the time of the interview as when they first organized, on the average 11 years earlier, and only 7 per cent had fewer physicians in 1947 than at the time of their origin.

Physicians Leaving the Groups

An important consideration in evaluating the stability of group practice would seem to be the incidence of physicians leaving a group in the course of time. The available material permits only a tentative answer to this question, yet even limited information may be useful in view of the apparent lack of quantitative data on the subject.

The number of original members who left their groups, in relation to age of the organization, is available for 63 medical groups. Of this number, 38 per cent still retained all their original members over a mean period

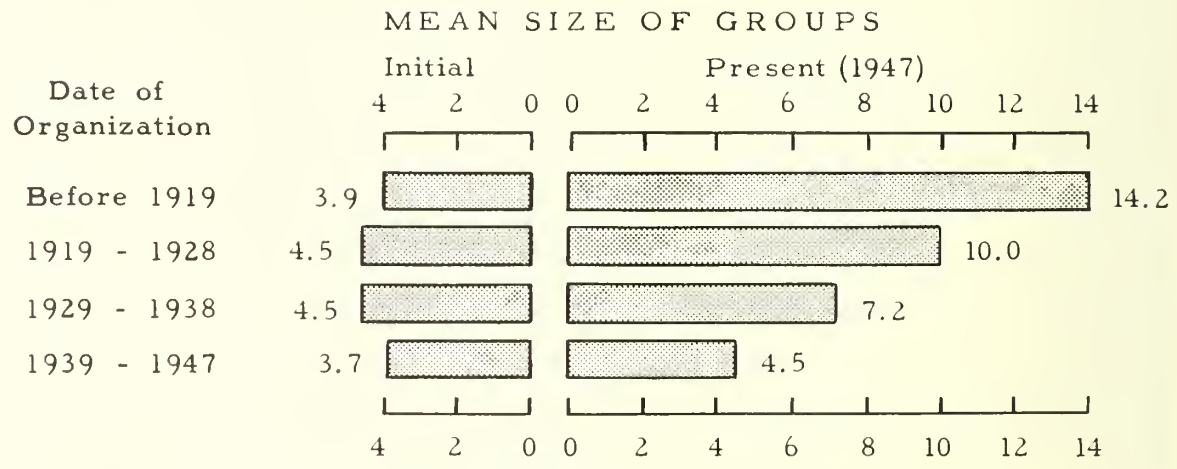


Fig. 2. Growth in size of groups (full-time physicians) in relation to date of organization.

Increase in Size of Groups

Figure 2 illustrates the growth in size of 81 medical groups classified according to the date of their initial organization.[8] The number of physicians starting as a

[8]Of the 81 medical groups providing information on size of staff at present and when initially organized, 16 were formed before 1919, 26 during 1919-1928, 26 in 1929-1938, and 13 in 1939-1947.

of 12.8 years; 18 per cent had lost one original member during a mean interval of 17.0 years; 28 per cent were minus 2 or 3 of their charter members over a span of about 25 years; and 16 per cent had lost 4 or more initial members over a period of 22.7 years.

The 63 groups, in existence 18.8 years, had lost an average of 1.7 physicians. Of the 105 physicians who left the groups during this time, 52 per cent had done

so voluntarily, i. e., gone into private practice or to another group; 37 per cent had died while with the group; and 11 per cent had been retired. None of the original members had left voluntarily in 57 per cent of the groups during a mean existence of 16 years of these groups, and one physician only did so in 24 per cent of the groups over a period of 21.9 years. In short, most of the groups of the present sample have retained their original members until death or retirement.

Additional information on physicians leaving the organization was obtained from 18 groups for the period 1940-1946. A mean of 3.3 physicians had left the groups during this time, including those who died or retired, or 41.2 per cent of the average number of physicians in the groups during this period of 6 or 7 years.[9] The range in the number of physicians having left a group during this interval varied between none and 10, with a maximum ratio (physicians leaving to mean size of the group) of 100 per cent.

In considering the number of physicians leaving the groups between 1940-1946, cognizance must be taken of the fact that this was an unstable period, with induction of large numbers of physicians into the armed services during the war. It should be noted also that staff changes in some of the groups involved physicians employed on a temporary or "probationary" basis.

Medical Vacancies in Groups

The responsible authorities of a number of medical groups were asked whether new physicians were to be added to their staffs in the immediate future. Affirmative answers were counted as such only when definite measures had been taken to obtain the services of a new physician. In many instances arrangements had already been made for a new physician to join the group at a specified date. It is felt, therefore, that the information on this question of medical vacancies, obtained from 66 groups, is substantially realistic.

The number of groups seeking a specified number of physicians is indicated below:

NUMBER OF NEW PHYSICIANS SOUGHT BY GROUPS IN 1947

	0	1	2	3	4	5
Number of groups	24	25	10	4	2	1

Thus 42, or 64 per cent, of these groups were planning to increase their staff, the addition averaging nearly 2 physicians per group. It may be noted in this connection that the persons in authority in many groups commented on their inability to expand the medical staff, despite a definite need for such expansion, because of inadequate physical facilities and current difficulties in procuring building materials and services. Scarcity of building space and of materials, combined with high general construction costs, have probably postponed the organization of at least some new groups in the last few years.

There seems to be no special relationship between size of group and number of medical vacancies to be filled.

The fields of practice of the 70 physician vacancies in medical groups cover a wide range, although physicians qualified as specialists in eye, ear, nose and throat (20 physicians) and radiology (10 physicians), appear to be especially in demand. Six of the groups were adding internists to their staffs, while only 3 had openings for a general practitioner.[10] The additional physicians would bring new specialties to about half the groups and would add physicians to existing departments or services in the other half. All 4 groups seeking an orthopedic surgeon, and 7 of the 10 groups seeking a radiologist had no specialists in these fields; on the other hand, all 6 groups planning to add an internist, and all 3 groups seeking a general surgeon already had one or more of these specialists.

Some relationship between size of group and specialists sought could be discerned in a few instances. Thus, no small group was planning to take on an ophthalmologist; openings in pathology were in the large groups only; and all but one of the groups seeking specialists in combined eye, ear, nose and throat were of small or medium size.

Comments

As noted in the section on longevity, the survival of a medical group may be significantly influenced by its size. The loss of one member in a three-man group, for example, would immediately change its status by definition. Since a previous study (3) has indicated a recent general trend toward increase in size of groups, the importance of this factor in the survival of groups may correspondingly diminish in the course of time.

The type of organization of the group probably also has a considerable effect on its survival. Thus, regardless of size, a medical group may have to dissolve on the death or retirement of a single owner or even of a couple of partners when all other physicians in the group are employed by the owner or partnership. When, on the other hand, all or most of the physicians, especially in medium size or large groups, participate in ownership of physical assets and distribution of net income, the death or retirement or voluntary withdrawal of one or two members will not necessarily affect the continuity of the group. The survival of groups sponsored by consumer organizations, community hospitals or industrial companies, also would not likely be affected by the withdrawal of an individual member, providing the minimum number of three physicians is maintained.

In conclusion, it may not be amiss to note again that, according to the present sample, medical group practice

[9]The ratio of persons leaving to size of the group was computed thus: the number of full-time physicians in a group in 1940 and at the time of the interview were averaged; this average was then divided by the number of physicians having left the group between 1940-1946. The average number of physicians in the 18 groups in 1940 and at the time of the interview was 8.7 and 11.3, respectively.

[10]Two of the three groups were having two general practitioners join their staffs, the only instance of groups seeking more than one physician of the same type.

has been in many instances a long-lived, relatively stable, mode of practicing medicine.

Summary

Consideration of the growth of medical groups, based on a sample of approximately a fourth of all such groups known to exist in the United States in 1946, indicated the following:

1. The mean age of functioning medical groups was 20 years and nearly a fourth of the total sample had been organized 30 or more years ago.

2. A significant relationship seems to exist between age of practicing groups, size of group, and size of community, namely, the larger the community the larger and older the group.

3. The number of physicians initially organizing the groups averaged 4 to 5. The oldest groups have the largest average staff at present, while size of group diminishes with recency of organization. The average staff of all the groups increased from 4 at the time of founding to 9 physicians by 1946-1947.

4. Number of original members leaving 63 groups, in existence an average of about 19 years, was 1.7 physicians per group. In 18 groups the rate of all physicians leaving between 1940 and 1946, in relation to average size of the groups during this period, was 41.2 per cent.

5. Sixty-four per cent of 66 groups reported they were definitely increasing their medical staffs in the immediate future. The average increase was to be nearly 2 physicians per group. Physicians qualified to provide eye, ear, nose and throat and radiological services were most in demand.

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Acknowledgments

The writer is indebted to Miss Ruth Wadman and J. Ross Hague, M.D., who collected the material under discussion, largely under the supervision of G. Halsey Hunt, M.D. Thanks are due Dr. Hunt, Leslie A. Falk, M.D., Miss Martha D. Ring, and Mr. Isidore Altman, for a critical perusal of the manuscript. To Dr. Antonio Ciocco, Deputy Chief of the Division of Public Health Methods, the writer is deeply obligated for most helpful suggestions in organization of the paper.

NATIONAL HEART WEEK

National Heart Week in 1949 has been designated as the week of February 14 to 21. It will be a period of intensified public education and fund raising within the national campaign of the American Heart Association, February 7 to 28.

Though limited drives were conducted in 1947 and 1948, this will be the first major campaign of the Association. It will be nation-wide in scope, and will seek contributions totalling $5,000,000. Local affiliated heart associations have been provided with top central leadership, field guidance and practical campaign material. They will retain 70 per cent of the funds collected in their areas to facilitate locally needed projects in research, education, clinical and other community services.

Physicians everywhere have been giving willing and invaluable assistance to local campaign efforts, considering themselves as the group basically concerned with the fight against heart disease. Reports from various regions indicate that physicians not only have been assisting in organizational activities, but have rendered important services by speaking on heart disease before civic and club groups. These first-hand reports by physicians have spurred the recruiting of volunteer workers.

Bacteriologic Studies by New Methods of a Major Epidemic of Poliomyelitis, 1947*

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The epidemic of poliomyelitis studied occurred during the summer of 1947, and it was the fourth annual epidemic in a large city in the Midwestern section of the United States. Two hundred and forty-six frank cases, and a much larger number of suspected cases, occurred among the population of more than 350,000 inhabitants in 1947, fifty-nine cases in 1946, forty cases in 1945 and one hundred and twenty-three cases in 1944. The 1947 epidemic was one of only three sizeable outbreaks in the United States one year after the severe and extremely widespread epidemic of poliomyelitis of 1946. The reasons for this abnormal incidence of poliomyelitis had remained obscure. Various possible causes, such as flies and mosquitoes, sewage, the polluted water of an abandoned canal, swimming pools and the "smudged" atmosphere, were considered. The water and milk supplies were rigidly tested and found satisfactory, according to present day standards. The epidemic was characterized by a high incidence among the general population, especially among children, of a peculiar, relatively mild infection of the throat associated with fever for several days. The symptoms referable to the upper respiratory tract and to the central nervous system were similar among all persons ill, regardless of whether typical poliomyelitis did or did not develop. There was a high incidence of abortive or nonparalytic cases. The mortality rate was low, despite a high incidence of the bulbar type of the disease. The range in age incidence was wide; infants, young and older children and adults being afflicted. The range of involvement of muscles in different persons also was wide but, in agreement with the low mortality rate, complete paralysis of muscle groups was uncommon.†

From epidemiologic considerations,[1] this epidemic should not have occurred because of the previous high annual incidence of the disease. A special reason, therefore, seemed to be operative. By the use of special and new methods I attempted to determine the reason for this abnormally high incidence of poliomyelitis.

Methods of Study

Serial dilution cultures[2] were made in freshly prepared dextrose-brain broth, of nasopharyngeal swabbings and of the water and milk supplies. The dextrose-brain broth, as used, was prepared by adding pieces of fresh calf brain, approximately one part by volume, to six or seven parts of 0.2 per cent dextrose broth before autoclaving. The finished medium was placed in 15 ml. amounts in test tubes (6"x $\frac{5}{8}$"). Blood-agar plates were inoculated with nasopharyngeal swabbings and with the milk. Nasopharyngeal swabbings were made from behind and above the soft palate, without touching the tongue, using cotton wrapped aluminum wire bent to a suitable angle. The adherent material on the swabs was washed off in 2 ml. of solution of sodium chloride. Of this washing, 0.15 ml. was inoculated into the first tube of a series of five tubes of dextrose-brain broth; 1.5 ml. of water containing the sedimented organisms from 15 ml. of centrifuged water representing samplings of water supplies, and 1.5 ml. of each sample of milk were likewise added to the first tube in each series of five tubes of dextrose-brain broth. The samples of milk had been kept well refrigerated with ice until the cultures were made, which was usually within twenty-four hours after pasteurization. After thorough mixing with a sterile 1 ml. pipette, 0.15 ml. was transferred from tube to tube in each series. One pipette was used in each series to mix and transfer the respective materials from tube to tube. The dilutions of the nasopharyngeal washings ranged from 1:100 to 1:10,000,000,000; the dilutions of the milk ranged from 1:10 to 1:1,000,000,000 and of the water from 1:1 to 1:100,000,000. In making serial dilutions of sodium chloride solution suspensions or broth cultures containing specifically virulent streptococci, without changing pipettes, it was found that dilution of viable organisms often was far less than that of the liquid menstruum and that serial dilutions in the highly favorable medium, dextrose-brain broth, served to separate the pathogens from saprophytes, just as if the pathogens adhered to the surfaces of the pipette and the saprophytes did not.

The streptococcus used for inoculation of animals, for preparation of very dense suspensions of partially dehydrated streptococci in glycerol (2 parts) and saturated sodium chloride solution (1 part) for agglutination and precipitation studies and for the preparation of thermal antibody and of antigen, were obtained either from the end point of growth, usually in the third, fourth or fifth serial dilution, or from the first, second or third rapidly repeated sub-culture in dextrose-brain broth.

Young white mice of the Swiss type, weighing 15 to 18 gms., were inoculated routinely, under ether anesthesia, intracerebrally with 0.03 ml. or intraperitoneally with 1 ml., of 10:1 suspensions in solution of sodium chloride of the streptococcus from the nasopharynges of persons ill and from the milk, before and after from one to four pasteurizations in milk and after one or two animal passages.

*Presented at the meeting of the Ohio Branch of the Society of American Bacteriologists, Columbus, Ohio, October 25, 1947.

†Grateful acknowledgment is hereby made for the cooperation of superintendents of hospitals, nurses and children's homes; and directors of city and county health and water departments which made this study possible.

The resistance to heat of the streptococcus isolated from nasopharynx and from the pasteurized milk and other sources was determined by subjecting suspensions of the respective streptococci in autoclaved milk contained in 15 ml. amounts in rubbed capped bottles, to 145° F. or 158° F. for 30 minutes. The temperature inside of control vials containing milk was checked with certified thermometers. Sterility cultures were made in dextrose-brain broth.

The agglutinating action of normal and convalescent serum was determined in three five-fold dilutions of 1:10 to 1:250. That of "natural" antibody present in the serum of immunized horses and of thermal antibody prepared *in vitro* with streptococci isolated, respectively, in studies of poliomyelitis, arthritis and epilepsy was determined at four five-fold dilutions of 1:10 to 1:1,250. Two-tenths ml. of the respective dilutions of serums or thermal antibody, and 0.2 ml. of the respective suspensions containing approximately 6,000,000,000 streptococci per ml. were added to test tubes measuring 3"x⅜". The mixtures were thoroughly shaken and then incubated at 45 to 48° C. for eighteen hours. Readings were made under the edge of a shaded 100-watt light bulb against a non-reflecting black velvet cloth in a dark room. For the sake of brevity and clarity, the agglutinative titers in tables and text are given in per cent of the total possible. Maximal agglutination of 4 plus for each dilution was considered 100 per cent. The percentage was obtained by dividing the observed degree of agglutination by the total possible (12 for the three dilutions and 16 for the four five-fold dilutions).

In studies on the production of streptococcal antibodies *in vitro*, it has been found that as the bacteria disintegrate in sodium chloride solution suspensions, on application of heat in the autoclave, toxic components are destroyed, the remnants of organisms become sharply agglutinated and brownish in color and substances resembling antibodies suitable for diagnostic tests of specific antigen in skin or blood become demonstrable in the supernatant of the suspension.[3,4]

Sodium chloride solution suspensions of streptococci (10,000,000,000 organisms per ml.) which had been isolated in studies of poliomyelitis, and other diseases, were autoclaved for ninety-six hours and heated at 65° C. for one hour, respectively. To these suspensions phenol was added to equal 0.2 per cent. The bacteria-free supernatant of the autoclaved and heated suspensions represented antibody and antigen, respectively, and were injected intradermally for the detection of specific antigen and antibody in the skin or blood of persons ill, of well contacts and of noncontacts. Solutions similarly prepared from streptococci unrelated to poliomyelitis and NaCl solution containing 0.2 per cent phenol were injected as controls. Immediate erythematous reactions occurred after intradermal injection of 0.03 ml. of the supernatant solution containing antibody, provided antigen specifically related to the streptococcus from which the antibody was prepared was present in skin or blood. A similar, although usually a less intensive, erythema occurred immediately surrounding the site of injection of the antigen, provided antibody specifically related to the streptococcus was present in the skin or blood. In studies to be reported elsewhere of persons suffering from diverse diseases associated with specific types of streptococci, including poliomyelitis, erythematous reactions, indicating streptococcal antigen in skin or blood, that occurred after intradermal injection of thermal and natural antibody ran closely parallel and reactions obtained on injection of solutions of respective antigen and specific polysaccharide also ran closely parallel.

Results of Cultures of the Water Supply

Serial dilution cultures in dextrose-brain broth were made of 10:1 suspensions of the centrifuged sediment of forty samplings of water. Fourteen of these samplings were collected for me by the Water Department from widely separated parts of the city from outlets routinely tested. Seven were collected by the Department of Health in homes where poliomyelitis had recently occurred. Four samplings were of polluted water from a canal traversing the city and samplings were obtained from four swimming pools. I collected eleven samples from water supplies of buildings equipped with flush types of toilet valves, four at the inlet and seven within the buildings. Streptococci were isolated from but one of the fourteen samples representing the city supply routinely tested. This culture proved nonvirulent, was killed by standard pasteurization in milk and was not agglutinated by convalescent serum or by the poliomyelitis antistreptococcic serum. Streptococci grew in mixture with gram-negative, gas-forming bacilli in but one of the four samples of water from the canal and in four of the seven samples from within buildings equipped with the flush type of toilets. Thus, of the forty samples cultured, a streptococcus was isolated in pure culture from but one sample. Streptococci grew in mixture with other bacteria in cultures from five and streptococci did not grow in cultures of thirty-four of the forty samplings.

Results of a Study of the Milk Supply

The results of a microscopic examination and cultural study of the milk supply by making serial dilutions in dextrose-brain broth, according to the "flash" or "holding" methods of pasteurization, and of raw milk are summarized in Table 1. It will be seen that the number of streptococci found on microscopic examination of stained films and the incidence of isolations were uniformly higher, especially isolations in pure culture, from specimens that had been pasteurized by the "flash" method than by the "holding" method. In most instances, streptococci grew at extremely high dilutions of the milk in the serial dilution cultures in dextrose-brain broth, indicating the presence of large numbers of viable streptococci. Altogether, mixed or pure cultures of the streptococci grew in serial dilution cultures in fifty-four instances and pure cultures were obtained in twenty-two instances (37 per cent) of the sixty samples of thirty-two brands cultured, representing virtually the entire

Table 1

Summary of a Bacteriologic Study of the Milk Supply

Condition of milk		Number of brands	Samplings examined	Results of microscopic and bacteriologic studies of samplings of the milk supply						
				Microscopic examination of gram-safranine stained films				Serial dilution cultures in dextrose-brain broth		
				Streptococci present in						
				Large numbers	Moderate numbers	Small numbers	Total (per cent)	Mixture or in pure culture	Pure culture*	
									Number	Per cent
Pasteurized by	"Flash" method (161° or 165° F., 17 or 25 sec.)	3	19	6	5	6	**89**	19	18	**95**
	"Holding" method (145° for 30 min.)	25	37	5	8	11	**65**	33	13	35
Unpasteurized		4	4	0	2	1	75	2	1	25
Total		32	60	11	15	18	**73**	54	22	**37**

*From end point of growth

Table 2

Resistance of Pasteurization in Milk of Streptococci Isolated from Nasopharynges of Persons Having Poliomyelitis, and from the Milk Supply

Source of streptococci	Number of strains	Strains of streptococci that resisted pasteurization in milk at			
		145° F. for 30 minutes		158° F. for 30 minutes	
		Number	Per cent	Number	Per cent
Nasopharynges of persons having acute poliomyelitis	39	22	56		
Pasteurized milk supply	51	33	64		
Control: nonvirulent streptococci	15	2	13		
Persons having poliomyelitis, and the milk supply	15	10	**67**	4	27

milk supply of the city. Only relatively small numbers of streptococci grew on blood-agar plates.

The results of a study of the heat resistance in milk of the streptococci isolated from the nasopharynges of persons having poliomyelitis and from the milk supply are summarized in Table 2. The high incidence of isolations of the streptococcus, alike from nasopharynx and from the milk supply, and the low incidence of isolations of control strains after heating to 145° F. for thirty minutes and the low incidence of isolation of the specific strains after heating to 154° F. for thirty minutes are well shown and are in accord with previous studies.[5] The four of fifteen specific strains that resisted pasteurization at 154° F. for thirty minutes had resisted three previous pasteurizations at 145° F. Each of these four strains produced flaccid paralysis in mice on isolation after commercial pasteurization by the "flash" method, and all proved nonvirulent after three additional pasteurization including pasteurization at 154° F. for thirty minutes.

Results of Experiments in Mice

The results following inoculation of a large number of mice with the streptococcus isolated from the nasopharynges of persons having acute poliomyelitis, from the milk supply of the epidemic under study, and from outdoor air during September and early October, 1947, representing five Middle West states, in contrast to those obtained in mice similarly inoculated with streptococci

TABLE 3

Results in Mice Inoculated with Streptococci Isolated from the Nasopharynges of Persons Having Poliomyelitis and from the Milk Supply of a Major Epidemic, in Contrast to Results Obtained with Streptococci from Sources Other Than Poliomyelitis

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	Source of streptococci	Strains	MICE						
			Inoculated*	Observed to have		Mortality (per cent)	With lesions of lungs (per cent)	Cultures from brain after death	
				Paralysis (per cent)	Spasms (per cent)			Number	Per cent yielding streptococci
In relation to epidemic poliomyelitis	Poliomyelitis	25	54	**83**	5	72	1	31	96
	Pasteurized Milk Supply	19	165	**75**	4	44	4	76	87
	Outdoor air	7	22	**41**	5	68	2	15	68
Remote from epidemic poliomyelitis	Epilepsy	22	123	0	**75**	80	4	45	91
	Epidemic Respiratory Infections	32	60	0	2	67	**62**	32	75
	Schizophrenia	10	32**	6	0	59	0	17	100
	Miscellaneous	48	126	5	3	68	6	58	71

*About one-third of the animals in the first five groups were inoculated intraperitoneally. All others were inoculated intracerebrally.

**Twenty of the 32 mice became extremely excitable.

isolated from the nasopharynges of persons ill with diverse diseases remote from epidemic poliomyelitis, are summarized in Table 3. The strains isolated from persons having poliomyelitis, from the milk supply and, to a lesser but significant degree, from the outdoor air in September caused a high incidence of paralysis, usually flaccid in type, which was not the case following identical inoculations of streptococci from the control groups. In sharp contrast, streptococci isolated in studies of idiopathic epilepsy caused a very high incidence of spasms, often associated with generalized convulsions, and streptococci similarly isolated from nasopharynges of persons suffering from epidemic respiratory infections caused a high incidence of lesions of lungs. The mortality rate and isolations of streptococci from the brains of animals that succumbed, while significant, were not as distinctive as the symptoms and lesions that developed after inoculation of both the test and the control strains.

Results of Agglutination Tests

The agglutinative titer of the serum of horses prepared, respectively, with streptococci isolated in previous studies of poliomyelitis and arthritis, and that of thermal antibody prepared with streptococci isolated from the nasopharynges of persons having poliomyelitis in the epidemic under study, and of persons having epilepsy remote from poliomyelitis are summarized in Table 4. The much higher percentage of agglutination by the homologous natural and thermal antibody than that by heterologous antibody is strikingly shown.

The agglutinative titer of serums from persons was determined separately. A summary of the results of the different groups is shown in Table 5. It will be seen that the average percentage of total possible agglutination by the serums from persons having nonparalytic poliomyelitis was uniformly higher, and often much higher, both at five to twelve days and thirteen to twenty-one days after onset of the disease than the serums from persons of the same age having paralytic poliomyelitis. Moreover, there was a striking parallelism between agglutinative titer of the serums and antibody titer in skin or blood as determined by intradermal injection of specific streptococcal antigen. The agglutinative titer of the serum of well persons remote from the epidemic was always much lower than that of the serum of persons convalescing from mild poliomyelitis.

Results of Cutaneous Tests

The results of erythematous reactions to intradermal injection of thermal antibody and of antigen are summarized in Table 6. It will be seen that the average reactions in square centimeters and percentage of reactions 5 sq. cm. or more, indicating specific streptococcal antigen in skin or blood, was greatest among persons suffering from paralytic poliomyelitis (14.57 sq. cm.), next greatest in non-paralytics (13.90 sq. cm.); greater

TABLE 4

Agglutinative Titer of Antiserum Prepared in Horses and Thermal Antibody Prepared *in Vitro* with Streptococci Isolated in Studies of Poliomyelitis, Arthritis and Epilepsy for the Respective Streptococci

Source of "natural" and artificial antibody		PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION AT FIVE-FOLD DILUTIONS (1-10 TO 1-1250) OF ANTI-SERUM AND THERMAL ANTIBODY OF STREPTOCOCCI ISOLATED IN 1947 FROM:					
		Nasopharynges of persons having poliomyelitis in		Milk supply of	Nasopharynx remote from epidemic poliomyelitis		
						Persons having	
		1946 (2-78)	Epidemic under study (3-11)	(2-24)	Well persons (2-21)	Epilepsy (1-28)	Arthritis (1-30)
Antiserums prepared in horses with streptococci isolated in previous studies of	Poliomyelitis	**56**	**50**	**50**	6	0	6
	Arthritis	31	25	31	0	19	**56**
Artificial or thermal antibody prepared from streptococci isolated from nasopharynges of persons having	Poliomyelitis during current epidemic	**88**	**88**	**69**	19	31	38
	Epilepsy	38	38	38	25	**69**	19

TABLE 5

Agglutinative Titer of the Serum of Persons Suffering from Poliomyelitis for Streptococci Isolated in Studies of Poliomyelitis in Relation to the Titer of Streptococcic Antibody in Skin or Blood, Duration of the Disease and Degree of Paralysis

Groups			Duration of disease days	Serums	Average cutaneous reaction indicating antibody (sq. cm.)	PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION BY FIVE FOLD DILUTIONS OF 1-10 TO 1-250 OF THE SERUM OF PATIENTS, CONTACTS AND NONCONTACTS OF STREPTOCOCCI ISOLATED IN STUDIES OF					
						Epidemic poliomyelitis from					
						Nasopharynx				Pasteurized milk supply of a major epidemic 1947	Well persons remote from poliomyelitis 1947
						1946	1947	Spinal fluid brain and spinal cord 1935-44	Well persons in epidemic zone 1947		
Poliomyelitis	According to the duration of the disease and the degree of paralysis	None	5-12	7		**34**	**32**	**19**	**45**	**37**	8
		Severe		6		22	19	13	43	32	0
		Slight	13-21	9		**39**	**38**	**19**	**46**	**49**	7
		Severe		7		21	15	7	33	29	6
Contacts and noncontacts	According to cutaneous reactions indicating antibody in skin or blood	Large		15	**11.02**	**37**	**35**	**17**	**46**	**41**	7
		Small		8	2.01	19	16	12	31	35	2
		Large		8	**10.63**	**29**	**32**	**18**	**43**	**40**	7
		Small		5	5.49	23	18	8	27	25	5
Well persons remote from epidemic poliomyelitis				13		2	1	0	7	12	29

in persons that had not been exposed to poliomyelitis in 1946 (12.34 sq. cm. and 12.50 sq. cm.) than in persons that had been exposed in 1946 (10.08 sq. cm.) and slightly less in contacts and non-contacts (9.71 sq. cm.). In sharp contrast, reactions to antigen indicating specific streptococcal antibody in skin or blood were least among persons having paralytic poliomyelitis (4.06 sq. cm.), somewhat greater in non-paralytics (6.35 sq. cm.), still greater among well persons living in widely separated homes but not directly exposed to poliomyelitis in 1946 (8.08 sq. cm.) and well contacts and non-contacts (8.91 sq. cm.); reactions indicating antibody were greater among well physicians and nurses that had been exposed to poliomyelitis in 1946 (9.12 sq. cm.) than in those not

TABLE 6

Erythematous Reactions of Persons with Poliomyelitis and of Well Contacts and Noncontacts During the Epidemic of Poliomyelitis in Akron, Ohio (1947), Following Intradermal Injection of Streptococcic Thermal Antibody and Streptococcic Antigen

Groups of persons tested (September, 1947)		Persons tested	Average age*	Erythematous reactions to thermal antibody and to antigen prepared from streptococci isolated in studies of							
				Epidemic poliomyelitis				Respiratory infections		Well persons remote from poliomyelitis	
				Reactions indicating presence in skin or blood of streptococcic							
				Antigen		Antibody		Antigen		Antigen	
				Sq. cm.	% 5 sq. cm. or more	Sq. cm.	% 5 sq. cm. or more	Sq. cm.	% 5 sq. cm. or more	Sq. cm.	% 5 sq. cm. or more
Cases of nonparalytic poliomyelitis		35	8	**13.90**	**100**	**6.35**	**100**	5.70	33	3.28	23
Cases of paralytic poliomyelitis		29	13	**14.57**	**100**	4.06	45	3.84	24	3.38	21
Well contacts and noncontacts: children at a children's home		25	11	**9.71**	**100**	**8.91**	**92**	3.25	40	2.61	20
Well contacts: physicians, nurses and hospital personnel in relation to exposure to poliomyelitis in 1946	Not exposed	23	19	**12.34**	**82**	4.58	39	4.36	31	2.47	17
	Exposed	37	34	**10.08**	**100**	**9.12**	**100**	4.95	51	2.35	16
Well noncontacts: adult persons living in widely separated homes, exposed to poliomyelitis in 1946		25	31	**12.50**	**96**	**8.08**	**96**	3.27	40	3.82	36
Hospital personnel, Cincinnati, Ohio, remote from cases of poliomyelitis		31	37	5.82	61	2.58	23	2.32	16	2.23	13

*Years

TABLE 7

Erythematous Reaction to Intradermal Injection of Thermal Antibody and to Antigen prepared from Streptococci Isolated from the Nasopharynges of Persons Ill with Poliomyelitis, and from the Pasteurized Milk Supply in the Epidemic of Poliomyelitis under Study

Groups studied	Degree of paralysis	Average duration of disease (days)	Persons tested	Erythematous reactions in sq. cm. to intradermal injection of thermal antibody and to antigen prepared from streptococci isolated in studies of				
				Epidemic poliomyelitis				Controls*
				Under study		Elsewhere		
				Nasopharynx	Milk supply	Nasopharynx		
				Reactions indicating presence in skin or blood of streptococcic				
				Antigen	Antigen	Antigen	Antibody	Antigen
Persons having poliomyelitis	Severe	14	7	**8.75**	**11.20**	**12.48**	2.27	1.15
	Slight or none	6	6	**6.86**	**10.73**	**12.67**	**8.01**	2.82
Well contacts in epidemic under study			7	**7.42**	**9.40**	**10.96**	**6.80**	2.75
Non contacts remote from poliomyelitis			6	3.93	3.31	3.78	1.12	2.81

*Well persons remote from poliomyelitis

so exposed (4.58 sq. cm.). (See also Table 7). Reactions indicating antigen and antibody were far lower for the control group than for groups living in the epidemic under study. Reactions to injections of control antibody prepared from streptococci isolated from nasopharynges of persons suffering from respiratory infections and of well persons remote from poliomyelitis were uniformly far less than to antibody prepared from streptococci isolated in studies of poliomyelitis. However, reactions of persons ill, of contacts and non-contacts and other well persons in the epidemic under study, where mild infection of the throat was common, were significantly greater to antibody prepared from streptococci isolated in studies of respiratory infection than to antibody prepared from streptococci isolated from the nasopharynges of well persons.

Since the streptococcus isolated from the milk supply was agglutinated in a manner similar to the streptococcus isolated from persons suffering from poliomyelitis, indicating antigenic identity, then thermal antibody prepared from it should incite cutaneous reactions similar to those that occurred after injection of antibody prepared from the streptococcus isolated from the nasopharynges of persons having acute poliomyelitis. This proved to be so, as shown in Table 7. Moreover, similar reaction to intradermal injection of antibody prepared from the streptococcus isolated from the milk supply, from the nasopharynges of persons having poliomyelitis in the epidemic under study and in an epidemic elsewhere were obtained in persons who had contracted poliomyelitis and in well contacts in other mild outbreaks. Minimal reactions among non-contacts remote from poliomyelitis, tested as controls, also ran closely parallel. It is well shown too that there was a much higher antibody titer among persons with little or no paralysis (8.01 sq. cm.) than among persons severely paralyzed (2.2 sq. cm.).

On the basis of these findings and the fact that antigen and antibody titer of skin or blood were uniformly greater among persons residing in the epidemic under study than occurred in other epidemics (in 1946 and 1947, to be reported elsewhere), it was decided to study the effect of the ingestion of the milk by well persons remote from the epidemic.

Experimental Induction of Specific Cutaneous Reactions by Ingestion of the Contaminated Milk

One of the most used brands of homogenized milk from the epidemic zone, which was pasteurized by the "flash" method and from which the specific type of streptococcus was isolated, as well as from three previous samplings, was taken properly refrigerated to Cincinnati. This milk was ingested in parallel manner with a local brand of milk pasteurized at 145° F. for thirty minutes, from which the specific type of streptococcus was not isolable, by volunteer persons who did not react positively to intradermal tests. The conditions of the tests and the results obtained are shown in Figure 1.

The cutaneous reaction to thermal antibody prepared alike from the streptococcus isolated from nasopharynges of persons suffering from poliomyelitis and from the milk supply of the epidemic under study, indicating specific streptococcic antigen in skin or blood, had increased sharply in each person in two and ten hours after ingestion of two quarts of the milk during thirty-six hours. The reaction to repeat cutaneous tests had diminished in twenty-four hours for both antibody solutions. After eighteen days, the reaction to antibody prepared from the streptococcus isolated from the milk was negative whereas that to antibody prepared from the streptococcus isolated from nasopharynx was still elevated. Antibody to both strains had developed in eighteen days. In sharp contrast, there was no significant increase in antigen or antibody, measurable by intradermal injection of antibody and antigen prepared respectively, from streptococci isolated in studies of arthritis remote from poliomyelitis, in the group which ingested the milk from the epidemic under study. Moreover, no change in "poliomyelitic" or "arthritic" antigen or antibody content of the skin or blood occurred in the control group that ingested the control pasteurized milk from which the specific type of streptococcus was not isolable, or in the additional controls tested in parallel manner who did not receive milk during thirty-six hours.

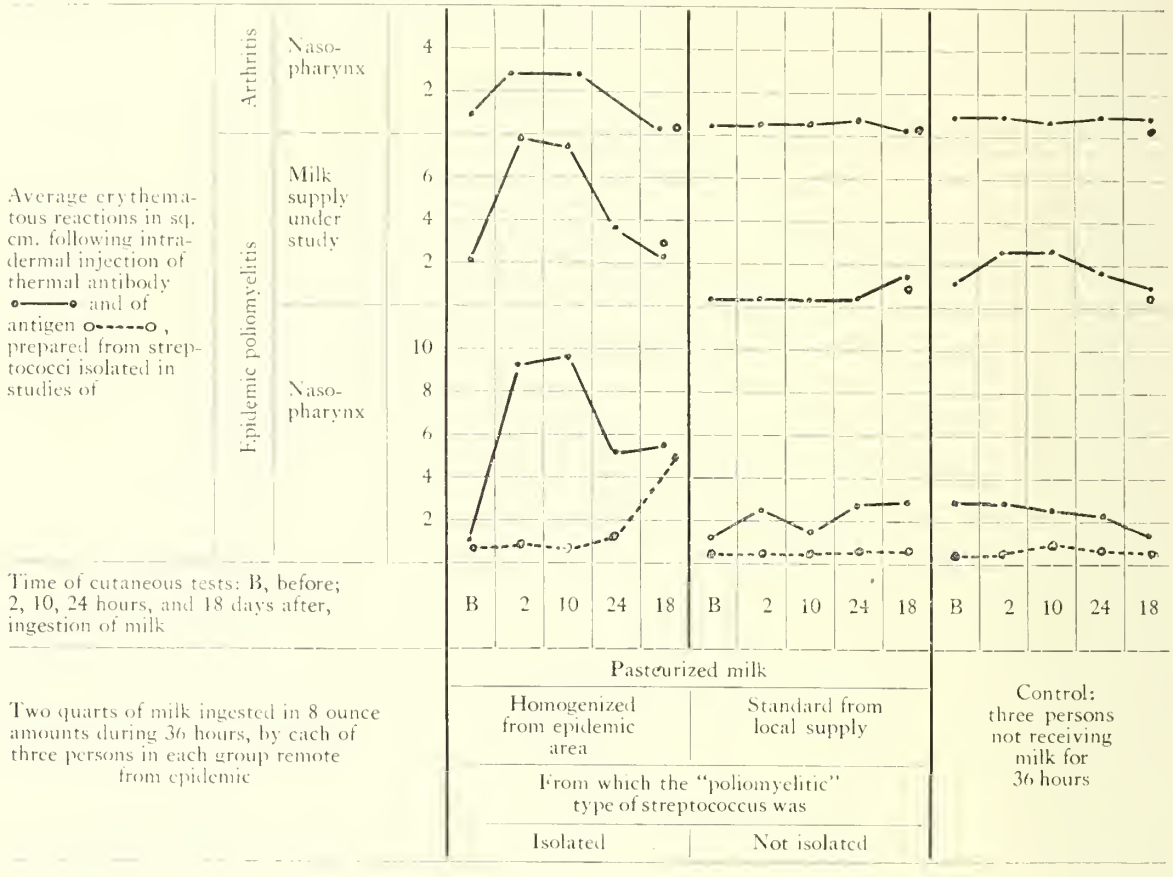
Summary and Comments

The results of a bacteriologic study, made by special and new methods, of a major epidemic, the fourth annual epidemic, of poliomyelitis in a large city are reported. A specific type of streptococcus, similar to the streptococcus isolated consistently in previous studies,[6,7] was isolated from the nasopharynges of all persons studied in whom poliomyelitis had developed and from the pasteurized milk supply in high incidence. Cutaneous reactions, indicating specific streptococcal antigen and antibody in skin or blood, and hence the presence of a specific type of streptococcal infection, were demonstrated consistently among persons suffering from abortive and paralytic poliomyelitis and among well contacts and non-contacts.

The cutaneous reactions, indicating specific streptococcal antigen and antibody, of virtually all persons tested were so much greater, especially reactions indicating antibody, than those obtained in studies of other epidemics and of sporadic cases as to suggest a source, or sources, of the streptococcus and perhaps virus other than, or in addition to, contact infection. Since streptococci having certain respective specific properties had been isolated previously from persons ill[6,7] and from unpotable water and from water and milk supplies[5,8] during epidemics of poliomyelitis, encephalitis and respiratory infections, since the streptococci thus isolated failed to grow in the aerobic mediums now universally used for the control of the bacterial content of milk supplies, and since they often resisted pasteurization at 145° F. for thirty minutes,[5] the water and milk supplies—even the pasteurized milk chiefly used—were considered as possible sources of infection. On the basis of these facts and the high incidence of the unusual type of infection of the throat in children, a bacteriologic study of the water and milk supplies was made by the special and new methods.

FIGURE 1

CUTANEOUS REACTIONS INDICATING ABSENCE OF "POLIOMYELITIC" STREPTOCOCCAL ANTIGEN AND ANTIBODY IN SKIN OR BLOOD OF PERSONS BEFORE, AND THEIR PRESENCE AFTER, INGESTION OF PASTEURIZED MILK FROM WHICH THE "POLIOMYELITIC" STREPTOCOCCUS WAS ISOLATED



The specific type of streptococcus was not isolable from any of the forty samplings of water, including the drinking supply, from the polluted water of the canal and from swimming pools. Streptococci grew or were isolated from fifty-two of fifty-six samplings of pasteurized milk and from two of four samplings of raw milk. Only relatively small numbers of streptococci grew on aerobic blood-agar plates. The bacterial count of the milk supply adequately tested by the health departments using the prescribed methods was well within the prescribed limits. However, mixed and pure cultures of the streptococcus grew in high, and often in extremely high, serial dilutions in dextrose-brain broth, indicating the presence of large, and often of extremely large, numbers of viable partial tension streptococci. This was especially true of samplings from milk that had been pasteurized by the "flash" method and which constituted the major supply of the city. The streptococcus isolated from the milk resembled the streptococcus isolated from the nasopharynges of persons in whom poliomyelitis had developed in the epidemic under study and elsewhere, in cultural requirements, morphology, staining reactions, in resistance to pasteurization, in serologic properties and in virulence. Strains from both sources were agglutinated specifically by convalescent serum, by the serum of horses that had been immunized previously with the streptococcus isolated in studies of poliomyelitis, and by thermal antibody prepared from the streptococcus isolated from the nasopharynges of persons ill in the epidemic under study. The streptococcus from both nasopharynx and milk produced flaccid paralysis in high incidence in mice following intracerebral or intraperitoneal inoculation and were isolated in pure culture from the brains of mice that succumbed.

The production in mice of the all-important symptom of poliomyelitis, flaccid paralysis, associated with edema, hemorrhage and degeneration of ganglion cells in the anterior horns of the spinal cord with the streptococcus isolated from persons ill and the milk supply is considered of fundamental importance even though some of the clinical and histological findings as seen in epidemic poliomyelitis in humans and experimental "virus" poliomyelitis in monkeys were lacking.

Cutaneous reactions to thermal antibody prepared from the streptococcus isolated from the milk and from the nasopharynges of persons in whom poliomyelitis had developed ran closely parallel in persons having poliomyelitis, in contacts and in non-contacts. Ingestion of

the contaminated milk caused skin test negative persons to become skin test positive to thermal antibody and to antigen, indicating respectively, the absorption of specific streptococcal antigen, the formation of specific antibody and the source of the abnormally high titer of antigen and antibody in persons ill and in well persons of the population.

The close parallelism between antibody titer in skin or blood, as determined by intradermal injection of antigen, and antibody titer in the serum as determined by agglutination tests, the presence of antigen in skin or blood in highest titer and antibody in lowest titer in paralytic poliomyelitis, and vice versa in well persons, further indicate causal relationship of the streptococcus or antigenic identity of the streptococcus and the virus.

The low antibody titer in paralytic poliomyelitis which was found in this study, and also in similar studies made elsewhere in 1947 and last year during the severe epidemic, is in striking accord with the low viral neutralizing titer in the serum of persons who had paralytic poliomyelitis, reported by Jensen.[9] Whether this striking lack of antibody formation in paralytic poliomyelitis is expressive of familial or "autarceologic" susceptibility, as suggested by Aycock [10] and as emphasized by Anderson,[1] or whether due to a particularly severe infection by the streptococcus or virus is not clear.

The data adduced in this study indicate that the streptococcus isolated alike from the nasopharynges of persons ill and from the milk supply was causative and perhaps indirectly a source of the virus as the infection by the streptococcus occurred, and that ingestion of the milk from which the streptococcus was isolated in such high incidence and in such large numbers played an important role in pathogenesis. On the basis of these and previous studies in which the specific type of the streptococcus was isolated consistently by my methods from milk obtained in a sterile manner from cows on farms where polio occurred from composite samples of milk and cream in epidemics,[5,6,7] and the fact that one epidemic traced to a milk supply came to an abrupt end by discontinuance of the use of the contaminated milk,[5] it was strongly urged that the milk supply of the city be pasteurized at a temperature shown to be adequate to kill the resistant specific type of streptococcus, and that the methods herein used be adopted for the isolation of specific types of streptococci and for the bacteriologic control of milk supplies.* The type of streptococcus isolated from the nasopharynges of persons and from the milk in this study has been isolated consistently in previous studies, by the special methods employed, from poliomyelitis virus, even from filtrates of the virus,[2,11] from the cerebrospinal fluid in the very early stages of the spontaneous disease and as fever appears in monkeys following intracerebral inoculation of virulent virus, and from the spinal cord after death in epidemic and experimental poliomyelitis.[11] Moreover, filtrable transmissible agents resembling poliomyelitic virus have been produced experimentally from neurotropic streptococci isolated in studies of poliomyelitis and from sources wholly remote from poliomyelitis.[12] It is suggested that the primary infection in poliomyelitis is streptococcal and that as this occurs a virus phase of the streptococcus may develop. The streptococcus, on the basis of present knowledge, is considered to be the large, cultivable, toxigenic, highly antigenic phase of the small, filtrable, highly invasive, but relatively nonantigenic, virus.

The studies on the virus made now for nearly 40 years have been so alluring that the solution of the problem has quite naturally been sought from this standpoint, almost to the exclusion of forthright bacteriologic studies. It is hoped that the results, reported herewith, will lead to a broader approach at the solution of this problem than that hitherto employed, to a study of both the streptococcus and the virus.

*In accord with the fact that the pasteurizing temperatures for the milk supply has not been increased; an abnormally high incidence of poliomyelitis again occurred in 1948—the fifth consecutive year.

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A New Method of Maintaining Therapeutic Penicillin Blood Levels on Oral Administration

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THE simultaneous administration of penicillin and sulfonamides is finding an ever increasing use in medical practice. This is undoubtedly due in part to the fact that there are certain difficulties involved to actually determine the organism causing a given infection so that the most specific drug could be chosen. In addition, however, a number of recent investigations indicate that a combined treatment with penicillin and sulfonamides is more effective than with any one of these drugs. Thus Gottlieb and Forsyth [8] reported that in infections with hemophilus influenza, which are relatively insensitive to penicillin recovery can be expected if massive doses of penicillin are given together with sulfadiazine. On the basis of in vitro tests Klein and Kalter [10] explain this additive effect of penicillin-sulfonamide mixtures as a result of the reduction by penicillin in the total number of bacterial cells to limits within which the sulfonamides become completely inhibitory. Dowling and his associates [6] have shown that a combination of penicillin and sulfadiazine is much more effective in reducing the mortality in patients with pneumococcus pneumonia than sulfadiazine alone.

A detailed study concerning synergistic activities of several chemo-therapeutic agents including penicillin and sulfadiazine or sulfathiazole in the treatment of various experimental infections in mice has been published by Kolmer.[11] The results demonstrate very clearly that a true synergism exists between penicillin and sulfonamides towards infections by staph. aureus, hemolytic streptococcus (Group A), pneumococcus (Type I) and eber. typhosa.

In a recent paper, Oettinger and Cronheim [13] reported studies on the use of a sulfadiazine-sulfathiazole mixture combined with sodium citrate and lactate as systemic alkalizers. Using the microcrystalline form of the sulfonamides, they obtained average free sulfonamide blood levels of 6.6 mg. per cent in children and 7.7 mg. per cent in adults. At the same time, the incidence of renal complications in the form of crystalluria was reduced to 2.5 per cent. Since sodium citrate is known to protect penicillin from the destructive action of gastric juice it seemed possible to add penicillin to this sulfonamide preparation for the simultaneous administration of these drugs. The results of this investigation are presented in this report.

The sulfonamide preparation used had the following composition:

Sulfadiazine (microcrystalline)	5%
Sulfathiazole (microcrystalline)	5%
Sodium Citrate	10%
Sodium Lactate	12%

in an aqueous suspension base containing vegetable gums.* The pH of this preparation is 6.5 and the sodium salts are equivalent in their systemic alkalinizing effect to 16.6 per cent of sodium bicarbonate (Cronheim and Bullock [5]). Varying amounts of penicillin were added in the form of calcium penicillin (Heyden) as indicated. Preliminary experiments had shown that the penicillin dissolved in the sulfonamide preparation was stable for about two weeks if kept in a refrigerator.

IN VITRO TESTS: To investigate the effect of the systemic alkalizers on the acidity of artificial gastric juice** the pH was measured after the addition of varying amounts of the penicillin-sulfonamide preparation. The values thus obtained are shown in Table 1, indicating the strong buffering capacity of the medication. It is also apparent from this table that the presence of

*This preparation is supplied by the S. E. Massengill Company, Bristol, Tennessee.

**

Hydrochloric acid (36%)	16.3 cc.	Pepsin	5.0 gm.
Sodium chloride	9.0 gm.	Lactic acid	1 gm.
Disodium phosphate	2.0 gm.	Amino-acetic acid	1 gm.
		Distilled water, q.s.	1000 cc.

TABLE I

pH of a Mixture of 25 cc. of Artificial Gastric Juice with Varying Amounts of Vehicle Used

Vehicle		cc. of vehicle added to 25 cc. of artificial gastric juice									
		—	1	2	3	4	5	6	7	8	9	10
Sodium Salts + Sulfonamides + Suspension Base	pH of Mixture	1.7	3.10	3.95	4.35	4.60	4.75	4.90	5.00	5.08	5.15	5.20
Sodium Salts + Sulfonamides		1.8	3.30	4.00	4.50	4.70	4.90	5.10	5.20	5.25	5.30	5.35
Sodium Salts + Suspension Base		1.8	3.00	4.05	4.30	4.50	4.70	4.85	5.00	5.08	5.15	5.20

the sulfonamides or the vegetable gums has no influence on the buffer action of the sodium citrate or the sodium lactate.

In order to study the protective action of the buffers 25 cc. portions of the artificial gastric juice were heated to 37.5° C and 10 cc. of the penicillin sulfonamide preparation preheated to 37.5° C and containing 50,000 units of penicillin were added. The penicillin content was determined immediately after mixing and after an incubation period of 30 minutes at 37.5° C using the FDA cup method with staph. aureus (No. 9144-ATCC). For control purposes one or several of the components of the penicillin-sulfonamide preparation were omitted as indicated in Table 2.

Table 2

Stability of Penicillin in Artificial Gastric Juice and in Water

50,000 units of calcium penicillin in 10 cc. of vehicle added to 25 cc. of artificial gastric juice or water and incubated for 30 minutes at 37.5° C. Penicillin determinations made in dilutions containing 1 unit per cc. using agar-plate cup method with staph. aureus.

	Artificial Gastric Juice		Water	
	Width of Zone of Inhibition in mm.			
	Before Incubation	After Incubation	Before Incubation	After Incubation
Sulfonamides + Sodium Salts + Suspension Base	7.3	7.0	8.4	8.1
Sulfonamides + Sodium Salts	7.6	7.2		
Sulfonamides + Suspension Base	6.1	0		
Sulfonamides	6.0	0	8.3	7.0
Sodium Salts + Suspension Base	7.7	7.2	8.3	7.4
Sodium Salts	7.5	7.6	8.0	7.6
Suspension Base	6.8	0	8.4	8.1
Water	6.9	0	8.3	8.2
	Fasting Gastric Juice			
Sulfonamides + Sodium Salts + Suspension Base	8.0	7.6		
	Gastric Juice after Alcohol Test Meal			
Sulfonamides + Sodium Salts + Suspension Base	7.9	7.5		

The figures show clearly the protective action afforded the penicillin by sodium citrate and lactate which is apparently due to the buffering capacity of these alkali salts. As to the other components of the preparation, they have no effect under the conditions of the experiment.

Using genuine gastric juice both from fasting individuals and after an alcohol test meal, the results were the same, namely full protection of the penicillin in the presence of sodium citrate and sodium lactate.

IN VIVO TESTS: After the protective action of sodium citrate and sodium lactate had been established, it was of interest to determine penicillin blood levels when this drug was given orally together with the sulfonamide-sodium salt preparation. For this purpose 51 non fasting healthy adult volunteers, mostly men, were used regardless of size, weight or age. Every person took one single 10 cc. dose of the sulfonamide preparation with varying amounts of penicillin added ranging from 50,000 to 300,000 units per dose followed by from 100 to 150 cc. of water. No particular plan was followed as to the time of the day when the medication was given. One blood sample was taken from each person at the end of either two or three or four hours.

The penicillin serum levels were assayed according to the method of Fleming et al.[7] by using staph. aureus (No. 9144-ATCC*) instead of hemolytic streptococcus. Since sufficient serum was available, the volumes of all liquids were increased so that the tests could be made in small test tubes, each tube containing after the serial dilution a total of 0.2 cc. The amount of inoculum used was 0.1 cc. of a 24-hour broth culture of staph. aureus added to 10 cc. of the serum-dextrose-phenolred medium. The penicillin concentration may be judged by the color change of the indicator and by the appearance of a sediment. Thus it is possible to estimate concentrations in between those of a simple serial dilution. However, due to the inaccuracies inherent in any dilution procedure all intermediate readings were disregarded and the figures reported represent always the lower concentration as calculated from the serial dilution. It might be mentioned that a comparison of the data obtained with this technique with those found with the B. sutilis method of Randall et al.[14] showed the same results. No blood samples were taken before the beginning of the experiment because the studies by Buggs et al.[3] and by Hoffman and Volini[9] had shown that normal serum does not inhibit the growth of staph. aureus.

Special attention was given to the question whether or not the presence of sulfonamides in the serum of these subjects would interfere with the penicillin determination. No effect of either sulfadiazine or sulfathiazole or an equal mixture of both in a concentration equivalent to a blood level of 10 mg. per cent could be

*This strain is designated by the Food and Drug Administration as F.D.A. 209-P.

found within the accuracy of the method. This was demonstrated by control tests in which penicillin and sulfonamides individually or in combination were added to normal serum. In another series of controls the sulfonamides present in the serum were inactivated by addition of p-amino-benzoic acid.

The individual as well as the average penicillin blood levels are summarized in Table 3. In addition to the

TABLE 3

Serum Concentration of Penicillin in Units per cc. After Single Dose

Dose (units)	Hours after Administration 2	3	4
300,000	0.96	0.24	0.24
	0.24	0.24	0.12
	0.48	0.48	0.12
	Average 0.56	Average 0.32	Average 0.16
100,000	0.24	0.12	0.12
	0.24	0.06	0.03
	0.12	0.12	0.06
	0.12	0.12	0.12
	0.12	0.24	0.06
	Average 0.17	Average 0.13	Average 0.08
50,000	0.12	0.03	0.03
	0.03	0.12	0.06
	0.06*	0.12**	0.06
	0.12*	0.06**	0.06
	0.06*	0.12**	0.03
	0.03	0.06**	0.06
	0.12	0.03*	0.03
	0.03	0.06*	0.03
	0.06	0.03*	0.03
	Average 0.07	Average 0.07	Average 0.03

*Plasma used in assay.
**Gums were omitted in the suspension base.

rather expected fact that higher doses of penicillin will result in higher blood levels there are two observations which should be pointed out.

1. Smaller doses of penicillin give a relatively higher blood level than larger doses thus indicating a better utilization of small amounts of the drug.

2. The protective action of the sulfonamide-sodium citrate-sodium lactate preparation is such that even four hours after a single oral dose of 50,000 units the penicillin blood level is still of the order of about 0.03 units per cc., an amount which is considered therapeutically significant.

The time of the administration of the drugs in relation to food intake did not seem to influence the results. This is in accord with the observations by Broh-Kahn and Pedrick,[2] that if sodium citrate is given orally together with penicillin the blood levels obtained are the same regardless whether the medication is given one hour before or after breakfast.

Since a blood level of approximately 0.03 units per cc. four hours after oral administration of 50,000 units is rather high, the question arose whether it might be due to some form of a temporary renal block caused by the administration of a total of 2.2 gm. of sodium salts. In order to investigate this possibility 10 cc. doses of the sulfonamide preparation plus 50,000 units of calcium penicillin were given to four hospitalized patients every four hours for periods ranging from twenty-four to thirty-two hours. The penicillin levels four hours after the last dose are listed in Table 4. It can be seen that

TABLE 4

Serum Concentration of Penicillin in Units per cc. after Repeated Doses of 50,000 Units. (Determination 4 hours after the last dose.)

Patient 1	0.06 u/cc.
Patient 2	0.06 u/cc.
Patient 3	0.12 u/cc.
Patient 4	0.03 u/cc.

a remarkably good penicillin blood level is obtained even after repeated oral doses of the medication. This result seems to exclude the possibility of a renal blockade. It might be added that no renal impairment had been observed when the sulfonamide preparation (without penicillin) had been used clinically in a series of 34 hospital patients. (Oettinger and Cronheim, l. c.). The fact that the penicillin blood level after repeated doses is somewhat higher than after a single dose—at least in this very small number of cases—can probably be explained on the basis of a slight cumulative effect. A similar observation has been reported Hoffman and Volini (l. c.) after repeated oral doses of 50,000 units of penicillin. These authors explain this "priming effect" by stating that "penicillin with the first doses was distributed to all the body fluids leaving a residual concentration at the end of each interval which, though not necessarily high enough to be measurable, allowed the attainment of a higher level with the succeeding doses."

DISCUSSION

The results reported in this investigation are remarkable in one respect, namely, that comparatively good and persistent blood levels are obtained after oral doses of 50,000 units of calcium penicillin. Apparently, this is due to the rather large amount of systemic alkalizers which is administered simultaneously in the form of sodium citrate and sodium lactate, since the presence or absence of the vegetable gums did not seem to have any noticeable influence (see Table 3). As to the mechanism involved, it has already been mentioned that these alkali salts due to their buffering capacity are able to prevent the destruction of penicillin by gastric juices. Since the amount of these alkali salts is greater than that usually employed, and since the buffering action persists until these salts are absorbed, the protection of penicillin in the gastro-intestinal tract is extended over a comparatively long period of time during which the penicillin may be absorbed into the circulation. Such an assumption is in accord with the reported observation that small amounts of penicillin are relatively better utilized than larger ones.

While the buffering action of sodium citrate and sodium lactate unquestionably contributes to the better utilization of orally administered penicillin, there are probably other factors present which add to or support this process. This is shown indirectly by the observations of McDermott, et al.[12] that even in subjects with complete achlorhydria the greater portion of orally given penicillin does not enter the circulation, but is lost in the alimentary canal. These authors conclude that it is more a problem of poor absorption of penicillin than destruction by acid. Thus one may perhaps assume that the presence of sodium citrate and sodium lactate results in a better utilization of the penicillin possibly because the pH in the stomach and in the duodenum is maintained at or near optimum conditions for absorption.

It is well known that the absorption of many drugs from the gastro-intestinal tract may be influenced by the vehicle or by some other substances given simultaneously. In the case of penicillin, Stewart and May [15] have shown that glucose sometimes has such an effect. These investigators found that in a certain number of individuals higher and more persistent blood levels of penicillin can be obtained when the drug is given orally in 5 or 20 per cent glucose solution.

Undoubtedly, there are other factors which have to be considered. While the pH of the gastric and duodenal contents has probably no effect upon the emptying time of the stomach, a number of substances including lactic acid and sodium bicarbonate in therapeutic doses are known to increase gastric tonus and peristalsis.[1] This latter observation may be of importance, because of the physical properties of the preparation used in this study. This suspension with a specific gravity of about 1.15 will not mix easily when poured into water, but will collect at the bottom of the container. Thus it seems not unreasonable to assume that at least a part of the ingested medication quickly reaches the lowest point of the greater curvature of the stomach where it will be exposed to peristalic waves, the strength of which is increased by the presence of lactic acid in the preparation. As a result, the drug will be transported fairly rapidly into the duodenum and thus be removed from the destructive action of the gastric secretion to that part of the gastro-intestinal tract where most of the absorption takes place.

In addition to this purely mechanical explanation considerable attention has been given by us to other possible protective mechanisms which may account for the good utilization of penicillin when given together with sulfonamides and systemic alkalizers. In a series of such in vitro experiments, it was found that suspensions of various sulfonamides in microcrystalline form are able to prevent the destruction of penicillin by penicillinase. (Cronheim and Baird [4].) It could also be shown that this protection is due to an adsorption of the enzyme on the microcrystals of the sulfa drugs. The possible implications of these observations to the problem of oral administration of penicillin plus sulfonamides has to be decided in future investigations.

Mention should also be made of the possibility that sulfonamides may protect penicillin by preventing or retarding the growth of penicillinase producing microorganisms, although Stewart and May [15] have recently reported that this type of destruction in the upper digestive tract is negligible.

While the foregoing experiments indicate that quite consistent and clinically significant penicillin blood levels are obtained when 50,000 units are given every four hours, it is also obvious that individual variations are fairly wide. Therefore, it seems advisable to establish for a therapeutic regimen a dosage of 100,000 units of penicillin in 10 cc. of the sulfonamide preparation every four hours after an initial dose of from two to three times this amount. With such a schedule it should be possible to maintain adequate blood levels of both penicillin and sulfonamides. As a further precaution it is advisable to give the preparation on a fasting stomach or between and not immediately following meals. These recommendations are based only on the penicillin blood levels and do not take into consideration a possible synergistic effect of the sulfonamides.

Summary

Penicillin has been administered orally, dissolved in an aqueous suspension of sulfadiazine and sulfathiazole together with sodium citrate and sodium lactate as systemic alkalizers. Therapeutically significant blood levels are quickly reached, and are maintained for at least three hours following an oral dose of 50,000 units of penicillin. It is suggested that the physical properties of the preparation together with the buffering action of the systemic alkalizers account for the good utilization of the penicillin.

For therapeutic use a dosage of 100,000 units of penicillin in 10 cc. of the sulfonamide-sodium citrate-lactate preparation at four hours interval is recommended after an initial dose of from two to three times this amount.

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The Clinical Evaluation of Glycerite of Hydrogen Peroxide in Vaginal and Cervical Infections

Preliminary Report

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GLYCERITE of hydrogen peroxide has been so successful in the treatment of dermatological infections, that it occurred to us that the solution might be useful in the treatment of infections of the mucous membranes, especially as seen in vaginal and cervical conditions.

The solution used consisted of glycerite of hydrogen peroxide as available in a 90 per cent solution of hydrogen peroxide dissolved in anhydrous glycerol to a dilution of 2.5 per cent.* For its fungicidal potency and for stabilizing purposes, oxine is present in a concentration of 0.1 per cent. Previous reports have described glycerite of hydrogen peroxide as bacteriotoxic for Gram-positive and Gram-negative organisms,[1] as well as for B. tetanus and C. Welchii [2] infections. It has been described as clinically effective for postoperative wound infections and for infections of the skin and mucous membranes.[3,5] Used orally, it lessens the number of pathogenic bacteria.[4]

Compounds containing glycerol and also hydrogen peroxide have been used for many years for the treatment of vaginal infections, and require therefore no detailed description. Oxine (8-hydroxy-quinoline) and its salts are used commonly as trichomonacides. The mixture, however, possesses properties desirable in a vaginal preparation in that the glycerol is hygroscopic; the peroxide, bacteriotoxic and deodorant; and the oxine, lethal to flagellate parasites.

Twenty successive patients were given treatment. All complained of vaginal discharge and clinically presented a typical syndrome of (1) acute vaginitis (mixed type); (2) cervical erosion with discharge; (3) vaginal trichomonas infestation. For this preliminary series, no bacteriological studies or hanging drop preparations were made, since we did not anticipate the results achieved, which we felt, however, warranted early publication. More detailed studies will be incorporated in subsequent communications.

For each patient a vaginal tampon was saturated with glycerite of hydrogen peroxide (2.5 per cent) and inserted vaginally. This was removed and the vagina and cervix inspected when the patient returned in twenty-four hours. When necessary (in 5 of 20 patients), a second tampon similarly medicated was inserted. The following brief protocols, typical of the first 12 patients, illustrate the clinical results.

*The glycerite of hydrogen peroxide (2.5 per cent) was supplied by the International Pharmaceutical Corporation, of Boston, Massachusetts.

1. M. C.: (70)—vaginal discharge, yellow, profuse, thick, foul-smelling, requiring a vaginal pad. Duration: 1 year. Examination: vagina—inflamed and covered with yellow, putrid, mucopus. Cervix eroded and similarly affected. Tampons, saturated in glycerite of hydrogen peroxide were inserted at 24-hour intervals. After 48 hours, the discharge ceased and the vagina was clean and odorless, although still inflamed. The patient reported one month later that there had been no recurrence of vaginal infection.

2. S. D.: (49)—supravaginal hysterectomy one year previously; profuse vaginal discharge. Duration: one week. Examination: erosion of cervix and severe cervicitis. No active vaginal infection. The medicated tampon was inserted and the patient returned in 48 hours, at which time, inspection of the cervix proved the absence of further discharge. No recurrence.

3. E. R.: (34) — erosion of cervix; endocervicitis; acute, nonspecific vaginitis. Exact duration unknown. Following tamponage with glycerite of hydrogen peroxide for 24 hours the cervix appeared as though it had been cauterized. Re-check visits 30 and 60 days following treatment proved that there had been no recurrence of the condition.

4. E. L.: (44)—vaginal discharge. Exact duration unknown. Examination showed the vulva reddened and the vagina inflamed and streaked with red. The cervix presents individual bleeding points and thick purulent discharge. One treatment completely cleared the infection. No recurrence.

5. P. R.: (33)—vaginal discharge. Duration: 3 weeks. Examination: vaginal bleeding points, cervical erosion, typical trichomoniasis. One treatment completely controlled the infection and the infestation. No recurrence.

6. R. K.: (30)—vaginal discharge and vulval pruritus. Duration: 1 month. Examination: thick, tenacious mucus, several superficial eroded areas on cervix, typical trichomoniasis. Result: complete clearing of condition; no recurrence.

7. F. W.: (37)—vaginal discharge. Duration: 3 months. The vagina blue and edematous; considerable mucopurulent discharge at vulva and cervix; typical trichomoniasis; complete cessation of discharge with one treatment; no recurrence.

8. R. S.: (35)—vaginal discharge. Exact duration unknown. Cervical erosions. Complete disappearance of lesion and discharge in one treatment; no recurrence.

9. D. S.: (45) — vaginal discharge. Duration: 6 months. Supravaginal hysterectomy six months pre-

viously; lacerated and eroded cervix. Thick, profuse discharge (trichomoniasis?). Complete remission following one treatment; no recurrence.

10. E. L.: (44)—vaginal discharge, white, glistening. Duration: unknown. Inflamed vagina and erosion of cervix; trichomoniasis. Tamponized with glycerite of hydrogen peroxide on two successive days. Complete remission; no recurrence.

11. S. R.: (27)—vaginal discharge, erosion of cervix. Cauterized (8/20/47); returned 11/26/47 — discharge more severe than on previous examination—trichomoniasis. On treatment with glycerite of hydrogen peroxide tamponage the condition cleared completely. No recurrence.

12. E. K. (33)—vaginal discharge. Duration: unknown. Erosion of cervix. Required treatment by tamponage on two successive days; complete remission; no recurrence.

In 15 of 20 patients, only one treatment was necessary. In 5, a second tampon was required. In one patient, the discharge recurred. In all of the others studied there has been no recurrence over a period of eight months. No patient complained of pain associated with the treatment. A larger second series, with basic laboratory studies and longer follow-up data is planned for a later report.

Summary

Twenty successive patients, presenting typical vaginal and cervical infections, bacterial and parasitic, were treated with glycerite of hydrogen peroxide tamponage. Fifteen patients had complete remission following one treatment. Five patients required a second treatment and in only one patient did the condition recur.

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American College Health Association

Psychotherapy in a College Health Center*

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SINCE the first college psychiatric service was established at West Point in 1920, great strides have been made in meeting the mental health needs of students, but a great deal more needs to be done. The most troublesome feature of the problem is the shortage of trained psychiatrists, and it is not likely that this will be relieved in the near future. In the meantime the emotional difficulties of students must be met. If we accept the concept that a sound personality is equally as important as a good education or a healthy body, then furnishing psychiatric help is a legitimate and necessary function of an educational institution. If this function is accepted as necessary and there are not enough available psychiatrists to do the work, then someone else must assume the responsibility. The physician to students must do some psychotherapy whether he wishes to do so or not, or even if he is not properly trained. The only question is whether he shall do a poor or a good job. This paper, therefore, is written primarily for the general physician who is interested in students as human beings having their normal quota of problems and conflicts, and who considers that the formation of sound attitudes and patterns of adjustment is a dignified and worthy aim of education. It is recognized that this is a field in which much harm can be done, but it is not conceded that partial training is worse than none. The fact that a problem is complex and difficult is no reason for ignoring it.

The small college situated away from a medical center is in a peculiarly difficult position to meet its students' mental health needs. Under ordinary circumstances the smaller colleges have relatively few illnesses of a psychotic nature, and hence the problem is not acute or spectacular. Because the common concept of the role of the psychiatrist is that of caring for psychotic patients, he seems to be an unnecessary part of the college organization. There is no reason to suspect that no mental health problems exist in small colleges. Experience has shown that under ordinary circumstances about 10 per cent of the student body at any college is apt to need psychiatric help at some time during each year. Students who need help are usually normal in almost every respect but are temporarily incapacitated by some difficulty in interpersonal relationships or in adjustment to the college environment. Frequently, students are labeled queer or eccentric when they are really struggling with a serious personal problem. Such persons are in the best position to profit by a mental health program.

*Read at the 26th annual meeting of the American Student Health Association, Detroit, May 7, 1948.

In many sections of the United States the smaller colleges are so located that one psychiatrist might be able to supervise the mental health program in several colleges, possibly up to three or four. Such a psychiatrist would be on call by telephone or otherwise for consultations regarding acute emergencies. In the meantime regular visits at weekly or bi-weekly intervals by the psychiatrist would enable the college physician to keep up with a continuous on-the-job training program. While it is recognized that such a program is far from ideal, it is a great deal better than none.

Psychotherapy will be discussed from the broad campus viewpoint as well as from the standpoint of the individual treatment of a student. Even the fully trained psychiatrist with no college health experience will find that there are several modifications of practice due to special conditions prevailing on the college campus which will enable him to make his work effective as well as accepted by faculty and students. Colleges have personalities which are as distinctive and individualistic as those of their students and many subtle characteristics of each college as well as of the academic scene must be kept in mind.

The attitude of the therapist toward the student and toward mental illness is of extreme importance. As Rennie and Woodward[1] have said it, he should hold the conviction that individual persons have great worth regardless of the presence or absence of economic assets, that all behavior has real and adequate causes, that personal attitudes are extremely significant both for the satisfaction of the individual and as a determinant of the number and quality of his relationships to others, and finally that people have a marked capacity for adjustment. He should be fond of students but not weaken his position and influence by identifying himself too closely with any individual or group. Consideration of emotional problems involves much tolerance, subtlety, and delicacy, and if a physician does not possess such qualities and attitudes, it would be unwise for him to attempt psychotherapy no matter what his training.

Students come to the health center for an astonishing variety of symptoms that are not due to any organic cause. As a general rule most of the symptoms are an expression of anxiety in one form or another, but this takes varied and frequently puzzling forms. The presenting symptom in cases treated in our clinic during the past few months and which were definitely found to be functional in origin included such physical symptoms as: fatigue, headache, nausea, fainting, urethral burning, palpitation, substernal oppression, epigastric distress,

neurodermatitis, and hyperacousis. Many students had difficulty in interpersonal relations especially with parents and persons of the opposite sex. Some were quite depressed, others very critical of the college and its educational methods, while others had unnatural fear of examinations. Interference with concentration, memory, and inability to make decisions were frequent even when clear-cut depression was not present. Sexual and marital relationships caused a great deal of conflict in several others. The number and variety of such symptoms and situations is virtually limitless.

The early college years are frequently marked by varying degrees of revolt against one or both parents, particularly the mother. In some instances the revolt takes the form which almost seems a conscious attempt to embarrass or disturb the parents; in others the symptomatology is vague and diffuse, consisting mainly of lack of interest in school work, poor motivation, indecision, and a seemingly carefree attitude which is not appropriate to the circumstances. This set of symptoms may occasionally progress to a true depression. It is a kind of "psychological sitdown strike" and in most instances when the student becomes aware of what he is protesting, he can make the necessary changes to effect an improvement in his circumstances.

If a student is having a great deal of difficulty emancipating himself from parents who are too dominant, he may acquire a sensitivity to authority in any form. This may show itself in severely critical attitudes toward his college and toward anyone who represents it. Then again other students acquire a strong competitive spirit and do everything with a sense of urgency, are constantly overmobilized, and they wonder why they are so easily fatigued and lacking in any sense of accomplishment. The more they work the less they get done and finally they find themselves taking less and less time for sleep but going to sleep constantly in class and working ineffectively at other times.

Still another group who have revolted against authority, convention, and "respectability" as they call it find themselves so isolated and forlorn that their anxiety becomes almost more than they can bear. Such individuals, while rejecting the old standards, look for something stable and meaningful that they can live for, and not finding it, are apt to accept uncritically some unusual or bizarre belief or adopt political doctrines of the extreme right or left.

Although a good percentage of patients will seek help of their own volition, there are many others who will of necessity have to be referred by other students, faculty members, or the Dean's Office. If a student shows any of the following types of behavior, he should be referred for examination: (1) Signs of preoccupation with some personal concern, leading to social isolation or change of living habits. (2) Impairment of memory and concentration. (3) Sudden lowering of scholastic standards. (4) Excessive cutting (one week plus or minus) when he has been an otherwise reliable and serious-minded person. (5) Any threat of suicide. (6) Peculiar or bizarre thought content in papers submitted. (7) Good evidence of homosexual activities. (8) Over-activity accompanied by irritability and repeated exercise of poor judgment.

Psychotherapy is the treatment of sick patients by psychological means. Its aim is to help the individual to adjust in a more satisfying manner to his environment, but this is a very broad aim indeed. It includes the treatment of anxiety and distress that occur in the course of all kinds of organic illnesses. It may be very helpful in the management of those individuals who are going to be subjected to disabling or mutilating operations.

As stated by Romano,[2] the variations of psychotherapy fall into two great types. The purpose of the one type is to help in the management of the individual by changing his environment, by assessing his physical state, and by reassurance so that his anxiety is allayed. In the other type methods and techniques are used which aim at finding some of the motivations for behavior as they relate to inner forces which may come into conflict. In the management of student problems by the physician who is interested in psychiatry but who is not fully trained the first type will be the one largely used.

It is well to keep in mind that treatment begins as soon as the student starts to relate his problem; therefore it is desirable not to interfere with him to any more than a minimal extent since the way that he relates his problem may give a clue as to what is bothering him most. Periods of silence need not be awkward if the physician does not become impatient or embarrassed. Sometimes he may tell about the most important feature of his history first and at other times he may spend several hours talking around his real problem and trying to avoid it. It is probably undesirable to have a systematic history form for students with emotional disorders, but the physician can bring out all pertinent material necessary by careful questions as the story unfolds. It is usually desirable to understand clearly the relationships in the patient's home, the general characteristics of his father, mother, brothers, and sisters, rivalries within the home, unusual behavior in childhood that attracted attention, neurotic determinants, school history, religious background, development of sexual attitudes, instances that lowered the patient's self-esteem emotionally, traumatic episodes of a dramatic nature, and his capacity for entering into satisfactory human relationships. In addition, his physical history should be correlated with his emotional history. It is well to know why the student chose to come to that particular school, whether he was disappointed or not, what kind of an adjustment he made, the extent of his participation in extracurricular activities, the variety of his friendships, and the quality of work done in his college courses. Recent social activities are nearly always of importance. While getting necessary information from the patient the mechanics of getting a record should be as unobtrusive as possible.

Close attention should be paid to signs or symptoms that may indicate the onset of dangerous developments in the student's illness. This is particularly true for the

physician who has had limited experience in this field. First of all any threat of suicide should not be dismissed lightly, and its implications should be thoroughly explored with the patient without getting him still further disturbed. For instance, the bold question, "Do you feel like you would like to commit suicide?" might do irrevocable harm and should be replaced by some such question as, "Do you sometimes feel so blue that life hardly seems worthwhile?" The manner of the physician often conveys much information to the patient, which may be either desirable or undesirable. If the patient gets the feeling that the physician is secure in his own emotional life and that his questions are motivated by a sincere desire to help him, then he will usually cooperate well. If, on the contrary, he feels that the physician's questions are too personal or are being put in an urgent or aggressive way, then he is likely to "shut up like a clam" or else give misleading answers to questions in order to get out of the situation quickly. Withdrawal from social activities, the development of grimacing or unusual mannerisms, evidence of frank hallucinations, and other similar symptoms should call for a consultation with a psychiatrist of wide experience.

Although the plan of treatment may seem aimless to the student, yet it is very definite in the therapist's mind. While he is listening to the patient's story, he is constantly evaluating the personality of the patient, and by skilled direction of the interview he gradually builds up a concept of the type of individual who is under treatment and the nature of his problem or conflict. He may thus help the student understand his own problem and get him on the way to solving the parts of it that can be solved or tolerating that which can not be changed.

During the course of the therapeutic interviews there are several principles to be observed that are almost axiomatic to the psychiatrist. The physician must not appear to be in too much of a hurry and so discourage his patient from revealing painful or embarrassing material. He must never become angry at a patient who has become a nuisance to him. When he does so he has lost a great portion of his influence on the patient. He must be a good listener and not take up the student's time by relating his own experiences and difficulties. He should not impose his own views on the patient. He should avoid putting interpretations into the patient's mind but lead him to make his own. He should never reassure the patient unless it is clearly justified. He should avoid taking a moralistic view of the student's behavior. He must not be shocked by anything he hears. He should not react to the irritability of others. He should avoid sweeping, dogmatic statements, because they are all too frequently misleading and damaging to the patient's confidence in the physician. It is entirely possible to maintain a manner which will inspire confidence without being dogmatic or too decisive. It is well to remember that the patient is making up his mind about the physician while the physician is studying the patient. The interaction between the two personalities forms a psychotherapeutic relationship, which, if favorable, will go a long way toward solving the patient's problems, but which, if unfavorable, may confirm him in his symptoms. The physician must have a good knowledge of himself and his own emotional makeup in order to make and maintain a favorable impression on the patient. In one's early enthusiasm for psychotherapy great care must be taken not to emphasize psychosomatic symptoms to the exclusion of other types of illness. A missionary spirit can be just as harmful in this field as in any other, and care must be taken at all times to hew closely to the line of the patient's difficulty and not get out of the general stream of medicine. Psychiatry is sometimes as badly served by its friends as by its enemies.

Since interest in the borderline problems between internal medicine and psychiatry is now increasing rapidly, the physician who goes into this field must not make the mistake of becoming too enthusiastic. It is no more awkward to do a laparotomy on a patient with a gastric neurosis than it is to treat a patient with a brain tumor for psychoneurosis. Simply because the physician has found a new method for treating his patients is no reason why this method should be used all the time. In general it is wiser to make mistakes in the direction of doing too little than in doing too much. The physician must try to remain objective although at the same time his relationship with the patient must be warm and understanding.

If one assumes responsibility for treating emotional problems of his patient, then he must be prepared for occasional unpleasant surprises. It is nearly impossible to predict in all cases whether a depressed patient is suicidal or not. Of course, it is assumed that all patients with a depression are potentially suicidal, but if one acted in every instance to protect himself from criticism if something goes wrong, he would indeed do a great deal of harm. About the best that one can do is to keep the possibility of suicide in mind and to take the necessary precautions when overt signs are present. It is probably better in the long run to have an occasional suicide than to deprive a large number of people of their liberty unnecessarily and in this way possibly causing even more tragedy.

There is a constant tendency on the part of the physician who has had relatively little experience in solving emotional problems to be aggressive in a therapeutic sense. The average physician is called upon to make decisions quickly and to act definitely and with authority when treating organic disease, and this attitude is apt to persist to an undesirable degree when treating functional diseases.

The physician may do harm by being too aggressive, by talking too much, by giving direct advice, by imposing his standards on others, by casting a reflection, if only by inference, on the patient's religious, racial, or social background, as well as by failure to recognize the more serious signs of mental illness. If the student's disclosure reveals material which would be punishable if known in the Dean's Office, then the physician must remember that his relationship with the patient is a confidential

one. Close cooperation and mutual discussion of common problems with the Dean is very necessary and desirable and can be done without violating the student's privacy in an essential way. The therapist must never laugh at a patient. He must keep himself aware of the attitudes of his patients on such questions as religion, sex modesty, and other emotionally charged areas. He must never belittle the patient's symptoms or tell him they are imaginary. Whether the symptoms are important to the doctor or not they certainly are to the patient or else he would not have bothered to consult the physician. In talking at any public meeting on the campus, the physician must exercise a great deal of care in choosing examples from his practice which will illustrate the points he wants to develop. Illustrations had better be taken from textbooks or even made up in a composite way from several individual cases in order that patients will not be embarrassed.

It is frequently desirable to give the student a full and accurate description of how his physical symptoms are produced. This may and usually does involve a rather extended description of the functions of the autonomic nervous system and a discussion of how the body mobilizes its resources to protect itself by fight or flight. From that point it may be desirable to give fairly simple examples of disordered system function together with an explanation as to how symptoms may become unleashed from their moorings, so to speak, and hence lose immediate relationship to emotional stress. The simpler mental mechanisms may need to be explained.

Since the first job is to help the student become independent rather than to encourage his dependence, it is desirable to avoid giving direct advice except in very simple matters. For instance it is practically never desirable to advise a person on matters involving major life decisions such as marriage, divorce, sexual relationships, choice of occupation, and so on. To give advice is to assume more responsibility than the physician is justified in assuming, and it may perpetuate a dependent relationship which has already been harmful to the patient. By exploring all the possibilities of an important decision the student can be aided to make a wise decision, but it should be strictly his own.

Homosexual conflicts are always considered from a purely medical standpoint unless the individual concerned has violated the privacy of others. In that case disciplinary measures are taken by the Dean's Office just as in any other offense against the person or privacy of another individual.

In the students who are rebelling against their parents or authority in general in one way or another the aim of the physician may be to help him learn the characteristics of maturity and give him suggestions for attaining them gradually. There is no clear-cut definition of maturity, but the points listed by Saul[3] serve very well for discussion with the patient when the time is opportune. His definition of maturity assumes that "the adult is predominantly independent and responsible, with little need to regress, and also is giving and productive, although still able to relax and to receive normally; he is cooperative rather than egotistical and competitive; he is in relative harmony with his conscience, which easily integrates with his mature feelings and behavior; his sexuality is free and integrated with mating and responsible productive activity, both sexual and social; his hostility toward others and toward himself is minimal but is freely available for defense and constructive use; his grasp of reality is clear and unimpaired by the emotional astigmatisms of childhood; and freed from childhood patterns he is discriminating and highly adaptable. And among the many results of such development, his anxiety is at a minimum."

Sometimes a student comes for an interview and almost literally refuses to talk. As a general rule this lack of cooperation is based on fear and embarrassment, and he usually becomes cooperative when the physician assures him that the relationship is confidential, that he can speak freely about anything which is on his mind, and when he becomes convinced that the physician is genuinely interested in him. Repeated and aggressive questioning may prevent him from talking at all. Sometimes it is advisable to give simple examples that are similar to the problem that the student probably has and then indicate to him that other people have received help and if he will open up he might likewise find a solution.

Some students come to rely on the physician to an extent which encourages too great dependence. When this becomes evident, it may be desirable to decrease the length of each interview or the time between visits. Occasionally a patient begins to show his growing independence by "forgetting" an appointment, and this is frequently a hopeful sign. Some patients may need only an hour or two of time, while others may need help through their college course at various times. It is unusual for any one student to require more than 20 or 25 hours of time; if so, he is probably too ill to remain in school and should withdraw for treatment.

There are occasional special situations where it may be desirable to treat individuals in small groups. This has been done with patients who have peptic ulcers and with stammerers as well as those with severe anxiety states. The applicability of this method of treatment is somewhat limited in colleges both because of rigid schedules and because of questions of privacy. Further experience along this line would be highly desirable.

From the long term point of view it is desirable not to misrepresent psychiatric treatment by indulging in subterfuges to get the student to accept treatment. Since one function of a student health center is to inculcate desirable medical attitudes into the thinking of the students, the term psychiatry and psychiatric treatment should be used freely and accurately. Of course, it is not desirable to publicize psychiatric illnesses, but on the other hand a resort to elaborate secrecy and misrepresentation only invites increased publicity. If physicians themselves took a mature and sound attitude toward mental illness it would be much easier to develop such attitudes in the lay public.

The success of a mental hygiene program depends to a very large extent on its reputation among the students

and faculty. If the program is begun slowly, is not oversold, and word gets around that the physician is interested in his patients as persons, acceptance will then come naturally. A good way to spread information about the program is by talks to the faculty, to various clubs on the campus, to student government or activity groups, and in numerous conversations in the ordinary day-by-day campus contacts.

In the attempt to convince the faculty of a school or college that psychiatry does have a sound and worthwhile program to offer, students should not be put in the position of being able to profit from their illnesses. No special favors should be asked for a patient other than those based on time considerations of the same nature as occur in the patient with pneumonia or a serious injury. The confidence of the patient must be very carefully respected, and his permission secured before consulting with other faculty members except in unusual circumstances when the situation demands action and the best interests of the patient and his family call for secrecy.

In this paper there has been no attempt to discuss definitive psychotherapy such as would be carried on by the experienced psychiatrist. If one indulges in uncovering techniques of a deep nature, then he must be prepared to deal with whatever he uncovers, and that calls for full-fledged psychiatric training. In the relatively superficial problems that most students present the well trained internist with a warm interest in human beings, an understanding attitude, and a willingness to study psychiatric concepts, can do a very creditable job, and at the same time add to his efficiency in the rest of his medical practice.

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A. C. H. A. News

The San Francisco meeting was very successful with an attendance of 111 at the meetings and the luncheon. Attendance was divided up as follows: West coast 30; Mountain states 17; Central states 30; East 4; Canada 2; and Guests (mostly west coast) 28.

The result of the vote as to choice of meeting time which was taken by mail in December 1948 came out as follows: May—82; December—46 votes; and other—10 votes. It was felt by the Council that May 1949 would be too soon for another meeting mostly because two meetings in one year would be impossible in terms of expense. The Council also felt that a year and half is too long to go without a national meeting. They, therefore, decided upon December 1949 as the best alternative.

In the general business meeting the following twelve new institutions were accepted for membership: Colorado A. & M. College, Fort Collins, Colorado; Associated Colleges, Claremont, California; Cornell College, Mt. Vernon, Iowa; Eastern Illinois State College, Charleston, Illinois; Fort Hays Kansas State College, Hays, Kansas; George Peabody College for Teachers, Nashville, Tennessee; Illinois Institute of Technology, Chicago, Illinois; Otterbein College, Westerville, Ohio; Loyola University of Los Angeles, California; De Paul University, Chicago, Illinois; Union Theological Seminary, New York City, New York; and University of Western Ontario, London, Ontario, Canada.

L. W. HOLDEN, Secretary

The JOURNAL LANCET

Official Journal of the American College Health Association, Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, Sioux Valley Medical Association, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology.

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Editorial

SOCIAL SECURITY FOR EMPLOYEES OF THE PHYSICIAN

Federal Social Security, in principle, has a great deal in common with preventive medicine. The prudent doctor, when consulted, perhaps too infrequently, by the healthy individual who wants to stay healthy, will prescribe a logical, sensible regime of diet, rest and exercise. In a like manner, this Federal statute makes orderly, logical provision in advance against personal economic ills—ills that plague most workers or their families when old age or death interrupt a healthy flow of income.

Your secretary, your laboratory assistant, the janitor who sweeps out your office, are covered under this insurance system. Each calendar quarter you report their earnings, together with their full name and Social Security number. The premiums for this insurance are the 1 per cent deductions which you, as employer, make from their salaries each pay-day, matched by a similar contribution from you. The face value of their policy is represented by payments to them at retirement, or to their survivors, should they die.

One or two illustrations may serve to show how this program operates to prevent or alleviate dependency. Take the case of the girl who has helped you keep your appointments, sent out your statements, and kept your office callers happy for the past ten or twelve years. Suppose she dies quite suddenly, leaving a wholly dependent mother. Monthly Social Security payments, representing a percentage of her average taxable earnings, will be sent, upon application and proof of dependency, to this girl's mother for life. Or, consider your janitor, now sixty-eight, whose age and general debility makes it necessary for him to retire. Regular monthly payments for him and his wife, for the balance of their lives, are provided for under this Federal program of Old-Age and Survivors Insurance.

Like the art and science of medicine, methods of meeting social and economic problems can not and will not remain static in a restless, changing world. Social Security is now a going concern which provides monthly income maintenance payments to well over two and a quarter million beneficiaries. Through any of its field offices, it is willing and anxious to serve you or your employees on any matter within its jurisdiction.

NEW KENNY INSTITUTE SETUP

Announcement of a new relationship between Sister Elizabeth Kenny and the medical profession assures the Kenny Institute of first-class medical supervision.

The institute, operated by the Elizabeth Kenny Foundation, now is headed by Dr. E. J. Huenekens, pediatrician, as chief of staff. Medical men head the various departments and are in charge of the technicians. Sister Kenny will remain with the institute as consultant and teacher. She has recently made the following statement: "This is a goal I have been working years for and at last have achieved. I quite agree with procedures of members of the medical profession for their caution in not embracing new ideas that may from time to time be presented, including my own, until they are satisfied they are effective.

"That is wisdom, and proves the public can confidently put its trust in their activities."

As background to Sister Kenny's statement, Dr. Huenekens said: "Four months ago I accepted the position of chief of staff of the Kenny Institute because I firmly believe in the value of Sister Kenny's treatment.

"There were two conditions to my acceptance: first, that I be given full responsibility for the medical direction of the hospital; second, that Dr. Miland E. Knapp have complete charge of the physical medicine aspects of the treatment with sole authority over the technicians, as he now has at University hospital and at Sheltering Arms.

"These conditions have been fully met."

Dr. Huenekens explained a further reason for accepting the position was to establish such relations with the University of Minnesota that the facilities of the institute would be open to its staff for research and evaluation of treatment.

"Most important of all, we hope to do away with the antagonism that exists between Sister Kenny and the medical profession, which has caused both to be misunderstood by the public.

"If these misunderstandings can be resolved, physicians will be able to judge the Kenny method objectively and to that end will be welcomed at the institute in the future to observe for themselves the treatment and the results.

"A wider service for children with other neuromuscular conditions who need physiotherapy will now be possible."

As chairman of the Minneapolis polio committee during the 1946 epidemic, Dr. Huenekens established close working relationships between the various groups aiding the treatment of polio.

At that time the medical profession studied all types of polio treatment and three recommended methods were adopted.

Book Reviews

The Differential Diagnosis of Jaundice, LEON SCHIFF, Ph.D., M.D. Chicago: The Year Book Publishers, Inc., 1946, 313 pp. with index, illustrated. Price, $5.50.

Precise determination of the cause of jaundice is now of consequential importance. Recent experience with infectious hepatitis has illuminated long dark phases of ictric hepatic disease. Knowledge of the functions of the liver derived from chemical and metabolic studies has fructified therapeusis. Bold surgery, sanely justifiable because of ancillary and supportive measures now available, is actually curative for conditions previously considered to be intractable. Estimation of extent of liver damage and degree of dysfunction is possible from results of several well-proved methods. Under these circumstances, a discussion of the differential diagnosis of jaundice is not only timely, but mandatory.

Leon Schiff, Associate Professor of Medicine of the University of Cincinnati, has presented currently accepted ideology of liver disease, and recounted specific procedures for identification of the several causes for jaundice. Recognition of the basis for icterus, in a particular instance, should lead to definitive treatment.

J. C.

The 1948 Year Book of General Medicine. Chicago: Year Book Publishers, Inc. $4.50.

A medical practitioner who today seeks to learn the latest and most effective diagnostic and therapeutic methods and procedures from a personal perusal of current medical literature is doomed to a state of confusion and despair. Attempts to read all that is printed about a single specialty are futile. Attendance at medical meetings and exchange of ideas and opinions by personal communication yield information of limited and uneven value.

One of the best sources of medical refreshment and nourishment is a Year Book of General Medicine, or of one of the specialties. The Year Book of General Medicine covers current topics in diseases of chest, blood, heart and blood vessels, digestive system and metabolism, and infectious diseases. Each subject is edited by an authority—Amberson, Minot, Harrison, Eusterman and Beeson. The material is chosen by each editor with discrimination and judgment and presented in abstract. Particularly useful are the editor's comments, which offer emphasis and criticism from a sound background of ample experience.

Uncertainties with respect to use of vaccine for influenza; antacids for neutralization of gastric acidity; folic acid, liver and iron; and of caronamides, are, if not thoroughly resolved, at least clarified. Reliable diagnostic methods are explained, their application directed and interpretation explained.

The size of the volume is convenient, the illustrations—unusual in reviews—are helpful.

J. B. C.

Fundamentals of Psychiatry, EDWARD A. STRECKER, M.D. Philadelphia: J. B. Lippincott Company, 1947, 310 pages, $4.00.

The fourth edition of this well known manual can be recommended to the medical profession as an excellent review of the field of psychiatry. It includes an unusual wealth of material in 310 pages of text written in a lucid fashion. Not only are the more basic ideas covered in a pleasing style but also new sections on psychosomatics and nomenclature are presented. The sections on psychiatric nursing and war neuroses are particularly commendable. Dr. Strecker's enthusiasm for his subject and his wise treatment of it make this volume most readable, informative, and timely.

F. T.

News Items

North Dakota

Dr. W. L. Diven was recently elected president of the staff of St. Alexius Hospital, Bismarck, North Dakota, succeeding Dr. W. B. Pierce. Dr. E. D. Perrin was named vice president and Dr. A. C. Grorud will serve as secretary-treasurer.

Dr. Edmund C. Stucke, veteran country doctor and one of North Dakota's most colorful political leaders, has announced his retirement from the active practice of medicine.

His practice in Garrison is being taken over by Dr. Martin Hochhauser, a native New Yorker who has recently practiced in Fargo.

Dr. S. C. Bacheller was appointed Enderlin city health officer at the January city council meeting.

Dr. Bacheller fills the vacancy created by the death of Dr. Gilbert Hendrickson, who had served as health officer a number of years.

Two pioneer North Dakota physicians and surgeons have announced their retirement from the Quain and Ramstad clinic at Bismarck. They are Dr. N. O. Ramstad, who with Dr. E. P. Quain founded the clinic in 1901, and Dr. V. J. LaRose, a member of the clinic since 1909. Both retired from the clinic and as members of the staffs of the Bismarck Evangelical and St. Alexius hospitals January 1.

For Dr. Ramstad, retirement marked the end of 49 years of medical and surgical service to the people of this area. For Dr. LaRose, it marked the completion of 46 years service. Dr. Ramstad came to Bismarck in 1900 to begin the practice of medicine, taking over the practice of Dr. E. P. Quain, who had come here in 1899, when the latter went to Europe for postgraduate study. When Dr. Quain returned, he and Dr. Ramstad associated themselves in a partnership which was the beginning of the present Quain and Ramstad Clinic.

Dr. LaRose came to Bismarck in 1902 and was associated with Drs. Quain and Ramstad for two years before establishing a practice in Mandan, where he was located for four years. In 1909, he returned to Bismarck and became a member of the clinic.

Two physicians have been added to the staff of Fargo clinic. Both native Minnesotans, they received their medical degrees from the University of Minnesota and served as interns at Minneapolis General Hospital. Both are World War II veterans.

Named to head the department of psychiatry is Dr. Marvin J. Geib, who practiced for a time at West Fargo. Becoming associated with the department of orthopedics is Dr. G. S. Ahern, who comes to Fargo from the Lovelace Clinic at Albuquerque, New Mexico.

The Northwest District Medical Society at a meeting held recently in Minot elected Dr. M. W. Garrison of Minot as its president for the coming year, succeeding Dr. Malcolm McCannel. Dr. Robert Goodman of Powers Lake was elected vice president, and Dr. Henry Kermott of Minot was re-elected secretary.

The board of county commissioners at a meeting in January appointed Dr. R. E. Mahowald and Dr. G. G. Thorgrimsen, Grand Forks, Dr. Robert St. Clair, Northwood, and Dr. C. O. Haugen, Larimore, as county physicians.

Dr. J. H. Mahoney, Devils Lake, was elected president of the Devils Lake district medical society at the January meeting. Other officers are Dr. Robert Fawcett, vice president; Dr. D. W. Fawcett, secretary; Dr. G. W. Toomey, delegate; Dr. William Fox, Rugby, alternate delegate; Dr. John Fawcett, councillor; and Dr. John D. Graham, program chairman.

Speakers were Dr. W. A. Liebler, Grand Forks, president of the state medical association, and Don Eagles, Fargo, manager of the North Dakota Hospital Service.

Dr. A. M. MarCia has come to Drayton and will assist Dr. H. M. Waldren in caring for the ills of the inhabitants of the community.

Dr. MarCia, a graduate of the North Dakota University Medical School and the Illinois University Medical School, served his internship in General Hospital in Fresno county, California, and later at St. Luke's in New York City, where he finished in July of this year.

South Dakota

Dr. H. M. Dehli, Colton, was named president of the Sioux Falls District Medical Society at a recent business meeting of that organization. About 50 doctors of the Sioux Falls area were present at the meeting.

Other officers named by the medical men were Dr. C. J. McDonald, Sioux Falls, vic president; Dr. Don H. Manning, Sioux Falls, secretary; and Dr. Paul C. Reagan, Sioux Falls, treasurer.

The Twelfth District Medical Society, comprising Roberts, Grant and Day counties, held its quarterly meeting in Sisseton December 8th. The following officers were elected for the coming year: president, Dr. Lovering, Webster; vice president, Dr. Brauer, Sisseton; secretary-treasurer, Dr. D. L. Dawson, Milbank.

Following a dinner and the business meeting, the society was addressed by Dr. Slaughter, dean of the medical school, University of South Dakota. Dr. Slaughter spoke on new and old pain-killing drugs.

Dr. H. G. Skinner, Rapid City, has been named a full-time health officer for that city. The announcement was made Monday by Dr. G. J. Van Heuvelen, state superintendent of health. Dr. Skinner formerly was with the university medical school and later practiced at Mobridge.

Dr. Paul V. McCarthy of Aberdeen is the new president of the Aberdeen District Medical Society. He was elected at a meeting of members in December to succeed Dr. G. J. Bloomendaal of Ipswich.

Other officers chosen were: Vice president, Dr. J. C. Rodine, Aberdeen, succeeding Dr. W. D. Farrell; secretary-treasurer, Dr. Granville Steele, Aberdeen, succeeding Dr. Rodine.

A paper was read at the dinner meeting by Dr. E. A. Banner, of the department of obstetrics and gynecology at Mayo Clinic, Rochester, Minnesota.

The South Dakota State Medical Association awarded its first 50-year practitioner pin to Dr. S. M. Hohf, long-time Yankton surgeon. Dr. Hohf was presented the pin at the annual meeting of the Yankton District Medical Society by Dr. John L. Calene of Aberdeen, president of the state association.

The Yankton District Medical Society elected Dr. C. B. McVay, president; Dr. F. H. Haas, vice president, and Dr. F. J. Abts, secretary-treasurer, as officers for 1949.

Officers for the Whetstone District Medical Society for next year are Dr. Lovering, Webster, president; Dr. Harry Brauer of Sisseton, vice president, and Dr. Dawson of Milbank, secretary-treasurer.

St. Bernard Hospital, Milbank, recently received several pieces of equipment purchased by the local physicians and donated in memory of their former colleague, the late Dr. F. N. Cliff.

Minnesota

Dr. D. A. Dukelow, director of the health and medical care division of the Hennepin County Community Chest and Council since 1945, is to become medical consultant on health and fitness for the American Medical Association, with headquarters in Chicago. He is to assume his new post in March.

Dr. S. T. Baetz, Maple Lake, was elected president of the Stearns-Benton County Medical Society at a recent meeting. Others named were Dr. R. C. Smith, Holdingford, vice president; Dr. J. N. Libert, St. Cloud, secretary-treasurer; Dr. J. E. Conway, St. Cloud, member of the advisory committee. Dr. J. F. DuBois, Sauk Centre, and Dr. C. S. Donaldson, Foley, delegates to the convention; and Dr. P. L. Halenbeck, St. Cloud, and Dr. Conway, alternates.

Dr. W. R. Schmidt, a surgeon with the Worthington Clinic for the past nine years, announced that he has resigned his position at the local clinic, effective January 1, 1949, to take a position with the veterans' hospital in Minneapolis in connection with the University of Minnesota.

Forty years of medical service to Worthington was ended by Dr. B. O. Mork, Sr., 81, when he retired January 1st. Dr. Mork, a native of Norway, came to the United States when he was 19. He worked several years for the Indian agency at Granite Falls. Later he attended Hamline university and was graduated in 1898. He returned to Hamline to finish his requirements for a medical degree which he did at the age of 40. Dr. Mork came to Worthington in 1908, formed a partnership with Dr. Henry Wiedow and the two operated the city hospital. Dr. Mork and four associates organized the Worthington Clinic in 1920.

Dr. J. J. Smyth of Lester Prairie and Dr. C. A. Anderson of Hector are now members of the Glencoe Municipal Hospital staff. Both are well-known practitioners in their respective communities and are a welcome addition to the staff.

Dr. P. G. Hoeper was elected president of St. Joseph's hospital staff physicians after an annual Christmas banquet for the group. Thirty-seven physicians attended the affair. Other officers elected for 1949 were: Dr. J. A. Butzer, vice president; Dr. A. A. Schmitz, secretary-treasurer; and, on the executive committee, Dr. M. I. Howard, chairman, Dr. A. E. Sohmer and Dr. J. A. Butzer.

Dr. E. H. Dewey, Owatonna, was elected president; Otto B. Fesenmaier, New Ulm, vice president, and Dr. Roger G. Hassett of Mankato, secretary-treasurer of the southern Minnesota branch of the American academy of general practice at a recent annual meeting of the organization.

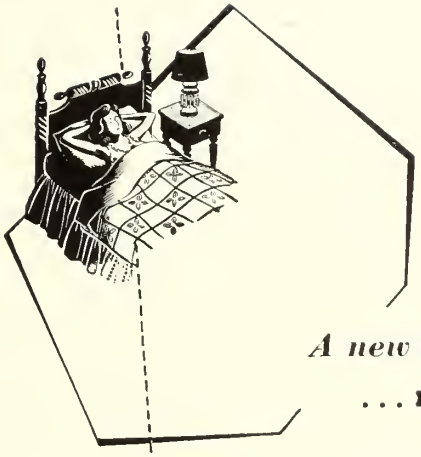
Dr. T. A. Estrem of Hibbing was elected president of the Range Medical Society at a recent meeting in Chisholm. Dr. Sidney Blackbourne of Keewatin was voted vice president and Dr. R. E. Hansen of Hibbing, secretary-treasurer.

Dr. Robert L. Nelson, Duluth, president, St. Louis County Heart Association and Dr. F. J. Hirschboeck, Duluth, member, state board of directors, Minnesota branch, American Heart Association, are among local leaders participating in plans for a major campaign by the A.H.A. in February to raise funds for heart disease research.

Dr. A. A. Schmitz was elected president of the Blue Earth County Medical Society at the recent annual meeting. Dr. R. W. Kearney was named vice president and Dr. O. H. Jones, secretary-treasurer.

Dr. James C. Masson, 67, chief of the Mayo clinic's surgical staff since 1935, has retired. A well-known abdominal surgeon, Dr. Masson had been chief surgeon since the death of Dr. Edw. Starr Judd, successor to Dr. Wm. J. Mayo in the past.

Annual grant to the Dr. Wm. A. O'Brien memorial professorship in cancer research at the University of Minnesota was announced by officials of the Minnesota Division of the American Cancer Society. The sum of $5,000 was given to the University to finance Dr. Robert A. Huseby's work in cancer biology.



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his practice and had been serving the communities of Driscoll, Steele, Tuttle and Braddock from his office in Steele for the past 19 years.

Dr. Swan G. Wright, 70, Minneapolis, died December 13 at Swedish hospital, where he was a staff member. Born in Sweden, Dr. Wright had been in the United States for 66 years. He was a graduate of Hamline University Medical School, St. Paul, and a life member of Hennepin County Medical Association.

Dr. A. DeVries, 74, Platte, South Dakota, died December 15 after serving his community as a pioneer school teacher and doctor for 40 years.

Dr. W. E. White, 64, Ipswich, South Dakota, died January 4 after a long life of untiring service to his community. For many years Dr. White was the physician and surgeon for the Milwaukee Railroad and also served Edmunds county as superintendent of the board of health for many years, a position to which he was repeatedly appointed by the state superintendent of public health at Pierre. The doctor was also a lifelong member of the Aberdeen District Medical Association and during his life missed only one convention of that group.

Dr. Harry F. Bayard, 50, Minneapolis physician, died January 14. Born in St. Paul, he had lived in Minneapolis since 1931. He graduated from the University of Minnesota medical school in 1921 and practiced in Stewartville, Minnesota, before becoming a fellow in proctology at the Mayo clinic, Rochester, in 1928.

Dr. George C. Jensen, 57, St. Paul eye specialist, died December 23rd. Dr. Jensen had offices at 512 Bremer Arcade.

Dr. Ralph B. Kettlewell, 45, Sauk Center, Minnesota, died January 6. He was graduated in 1932 from the University of Minnesota medical school and had since practiced medicine in Sauk Center.

Dr. Jerome Charles Evanson, 27, died November 19, 1948. He was born December 5, 1921, at Grand Forks, North Dakota. He received his AB degree from St. Olaf College in 1942, entered Marquette University, Milwaukee, Wisconsin, where he received his Doctor of Medicine.

Dr. Gerald C. Raskilly, 57, Minneapolis physician, died December 22.

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The JOURNAL LANCET

Minneapolis, Minnesota
March, 1949

Vol. LXIX, No. 3
New Series

Foreword

The April, 1948, issue of JOURNAL-LANCET was devoted almost exclusively to medical activities in North Dakota. Physicians from throughout the state contributed splendid articles on the results of research, medical organizations, private practice, etc. These published papers brought forth much favorable comment from many sources. The medical profession of North Dakota is composed of men and women who have graduated from many of the best medical schools in this country and Canada. A considerable number have taken graduate work in special fields. A large percentage have spent long years in practice, which has equipped them with a vast store of information unobtainable in any other way. Excellent clinics have been developed in several of the larger cities which have become widely known throughout this country. Many physicians practicing alone in villages have equipped their offices and laboratories so well that they are affording their communities most modern medical service. Thus medicine in all of its phases is on a high level in North Dakota. This was so emphasized by the presentations in the April, 1948, issue of the JOURNAL-LANCET that the publishers and editorial board decided to devote the March, 1949, issue to contributions of North Dakota physicians. The potentialities are so enormous and the North Dakota physicians have cooperated so whole-heartedly that the editorial board has recommended that this become an annual event.

J. A. MYERS, M.D.,
Chairman, Board of Editors

The Surgical Treatment of Degenerative Disease of the Hip Joint

Graham A. Kernwein, M.D.

Minot, North Dakota

THE term degenerative disease is used in lieu of the various other synonyms, osteoarthritis, hypertrophic arthritis, senile arthritis, arthritis deformans, and degenerative arthritis, because it better describes the pathology.

The principal pathological changes as described by Nichols and Richardson[1] in their original monograph are classical. The cardinal points, therefore, are summarized.

The earliest and primary gross change in the joint is degeneration of the hyalin articular cartilage in the weight bearing portion. Microscopically, this appears first as a fibrillation of the cartilage with a disappearance of the spindle-celled perichondrium. These changes occur at right angles to the articular surface and as they progress into the deeper layers, the neighboring cartilage cells are set free and finally disintegrate and disappear (Fig. 1.) The depth to which these changes occur varies

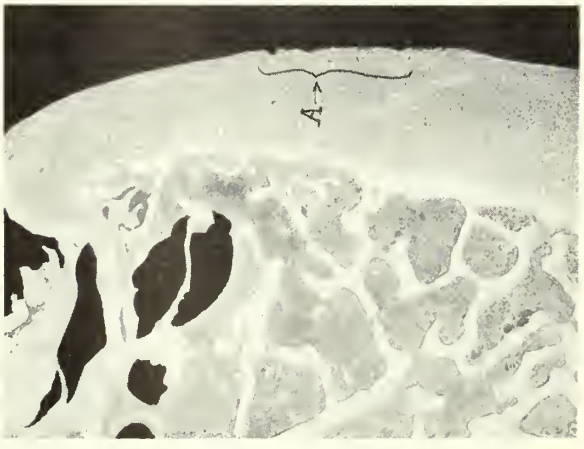


Fig. 1. Beginning fibrillation of the surface of the hyalin articular cartilage—Region A—Note the irregularity of the perichondriac layer.

from superficial ulceration to extension through the entire cartilage layer into the subchondral bone (Fig. 2). To compensate for this erosion and depression of one surface, the perichondrium of the contiguous portion of the opposite joint surface is stimulated and develops a papillary elevation. Erosions are opposed by papillary elevations, giving the surface a saw-tooth appearance. The changes occur slowly but progressively and motion is continued. Finally, bone is exposed and due to friction of motion, the involved trabeculae of the underlying bone hypertrophy. Eventually focal cavity formation

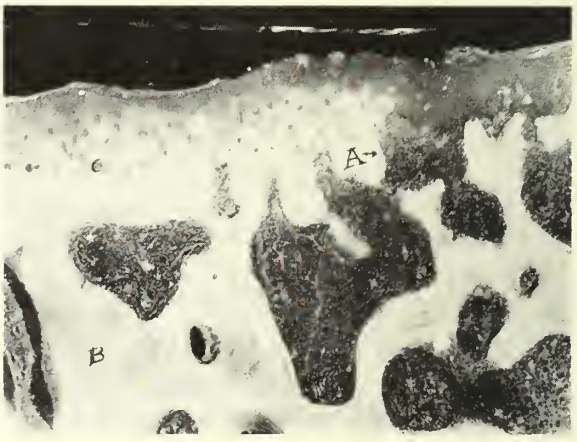


Fig. 2. Extensive surface erosion as evidenced by the irregular surface. In region (A) the degenerative process has extended through the entire thickness of the articular cartilage, with interruption of the bony articular cortex. (B) shows hypertrophy of subchondral bony trabeculae.

occurs (Fig. 3). In the roentgenogram, these regions of hypertrophied trabeculae then appear more dense and are called sclerotic or eburnated.

Slow progression of the erosion of one surface with overgrowth of the other, may result in sufficient changes

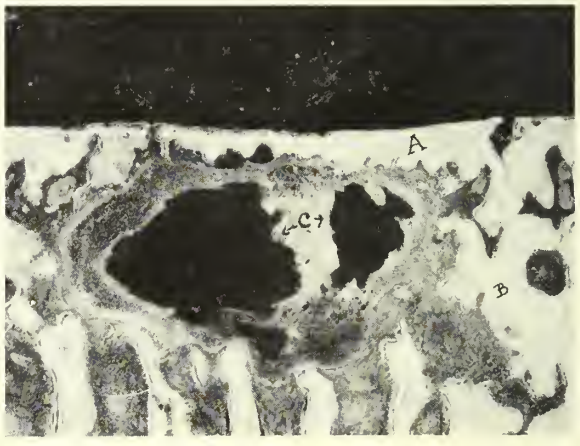


Fig. 3. Degenerative process so extensive the hyalin articular cartilage has been entirely destroyed, leaving the denuded bony articular cortex (A) exposed. As a result of the trauma of friction the subchondral trabeculae have hypertrophied (B) and in region (C) there is a cavity. The hypertrophied trabeculae are seen in a roentgenogram as region of sclerosis or increased density. The cavity appears in a roentgenogram as an area of lesser density.

in the joint surfaces to cause subluxation. The range of motion may be diminished greatly but true bony ankylosis never occurs.

Common among the little understood changes is an overgrowth of the perichondrium at a point where the cartilage and capsule come together. This results first in an irregular formation of cartilage about the circumference. When this cartilage becomes ossified, the spurs are seen in roentgenographic studies of the joint as osteophytes. To describe these latter changes, the roentgenologist coined the term hypertrophic arthritis (Fig. 4).



Fig. 4. Reduction of cartilage space in weight bearing area (A) with hypertrophy of the local trabeculae seen as local sclerosis (B). Cavity formation is visualized at (C) as focal region of lesser density. Marginal lipping or osteophyte formation at (D).

Characteristically, there is no great thickening of the joint capsule and usually the synovia appears quite normal. Inflammatory exudation is uncommon.

From the foregoing description, it is obvious that the characteristic changes are degenerative and not inflammatory in nature.

The primary changes are in the articular cartilage, degenerative in character, appearing earliest and being most marked in the weight-bearing areas.

The commonest cause of degenerative changes is the trauma of wear and tear in everyday life. Keefer et al.[2] studied a series of knee joints from normal individuals who, so far as could be determined, never had symptoms of joint disease. The joints were obtained at necropsy and at least six joints, representing each decade from the first to the tenth, were obtained. The joints were studied roentgenographically, microscopically, and macroscopically. These studies revealed increasing degenerative changes in the hyalin cartilage with each succeeding decade beyond the second. The changes often were not demonstrable by X-ray examination. Arteriosclerosis did not appear to play a part. The synovial tissues were normal or showed only minimal change. There was little or no attempt at repair. These changes from the earliest to the latest were indistinguishable from those commonly spoken of as characteristic of degenerative arthritis. As these changes were present without causing symptoms and often were not demonstrable by roentgenographic studies, it seems likely that they result from daily use and increasing age.

Therefore, if daily use and increasing age will suffice to produce degenerative changes in cartilage, constant use or unusual trauma should enhance these changes. Working upon this hypothesis, Bennett and Bauer[3] collected a group of cases that confirmed this concept. As an example, in one case, a woman who had worked as a cutter in a tailoring establishment for fifteen years had a prominent Heberden's node on the thumb of the hand used for cutting, but no such change was demonstrable on any of the other fingers.

It seems logical to conclude, therefore, that the pathological changes characteristic of so-called degenerative arthritis, are the result of the trauma of daily wear and tear. Other factors, either intrinsic or extrinsic, may enhance these changes.

Extrinsic enhancing factors include the trauma incident to the use of pneumatic tools, occupational overuse of one joint (as in the case of the seamstress cited above), malaligned fractures of the bones adjoining a joint, unusual stresses or strains upon a joint, loss of proprioceptive and pain sensation as seen in the arthropathies with lues, syringomyelia, leprosy, and peripheral nerve lesions.[4]

Intrinsic enhancing factors include changes as seen in Legg-Calvé-Perthes disease of long standing, slipped capital epiphysis, unreduced congenital dislocation of the hip with shelf formation in a secondary acetabulum, vascular changes following traumatic dislocations of the hip, intracapsular fractures of the neck of the femur and the trauma incident to loose bodies within a joint.

Pain is the usual presenting complaint. The pain may be located in the knee, thigh, low back or hip. Pain in the thigh or knee unassociated with objective findings in the local region of the complaint always should suggest hip disease. Hip disease with pain referred to the thigh or knee often goes unrecognized for many years because the aforementioned fact apparently is not generally appreciated.

Pain in the back is the result of strain placed on the lumbo-sacral joint. This appears only after there has been loss of motion in the hip joint. Restriction of motion with flexion-adduction deformity develops so gradually, the patient usually is unaware of it, although he may have limped for many years. Fixed flexion and adduction of the hip result in considerable functional shortening. In order to get the foot on the ground, the patient must tilt the pelvis sufficiently to overcome flexion deformity. As the flexion deformity may at times be as much as 45 to 60 degrees, it is obvious that to overcome it, the lumbo-sacral joint is placed under great strain.

A limp is perhaps the next most common complaint. The limp is an attempt to compensate for the functional

shortening due to the flexion deformity and also, may help to lessen the pain. It usually is most marked immediately upon resuming activity following a period of rest. The limp and pain abate somewhat when the joint gets "warmed up" and recur after prolonged use.

Restriction of motion develops so insidiously and is so readily accommodated for by pelvic tilt, the patient usually is unaware that restriction has occurred until it is marked. Early, the restriction is due to muscle spasm. Occasionally it may be the result of residual deformity of some such condition as slipped capital epiphysis or Legg-Calvé-Perthes disease. Eventually, however, muscle spasm develops and the powerful adductors when in spasm, result in the development of a flexion and adduction deformity. If this is permitted to remain uncorrected, the capsule becomes fibrosed and a so-called fibrous ankylosis develops.

The Patrick or Faber test is a simple and readily effected means of detecting hip disease. This test is accomplished with the patient in a supine position. The extremity to be examined is flexed so that the heel may be placed upon the knee of the opposite limb. Holding the hip flexed, the heel fixed upon the opposite knee, the flexed knee normally should be brought into a plane parallel with the abdomen and in many persons may be placed upon the examining table (Fig. 5). Failure to accomplish this test, painlessly, signifies hip involvement (Fig. 6). This test described by Patrick was called Faber, as it tested F flexion, AB abduction, and ER external rotation. The finer points of determining exactly the amount of limitation can be accomplished best by having the patient flex the normal leg until the thigh is held lying upon the abdomen. This fixes the pelvis. If a flexion deformity is present in the opposite leg, it immediately will become apparent (Fig. 7). Adduction, internal and external rotation range, determined with the good leg fixed, will be found to be entirely different from that which obtains when this simple point is overlooked.

Measurement of thigh and calf circumference should be recorded and if the patient has favored the leg over a period of years, an atrophy of disuse will be found in the musculature.

Roentgenological examination may reveal some primary condition as a cause for the additional strain resulting in a degenerative disease of the hip joint. Among these are slipped epiphysis, Legg-Perthes disease, malaligned fracture, loose bodies, etc. Early in the course of degenerative disease, roentgen changes are absent as cartilage is translucent to the X-ray and, therefore, not visualized. Narrowing of the cartilage space and eburnation of the bone in the weight-bearing portion are the first roentgenological changes to appear. Later, osteophytes may develop and in the subchondral portion, focal regions of lesser density appear (Fig. 4).

The prime function of treatment is to eliminate pain. Each patient must be evaluated individually and very carefully. Ideal treatment will eliminate pain, overcome deformity and restore motion. In evaluating any indi-



Fig. 5. Patient in supine position with right heel on left knee and right hip flexed, abducted and externally rotated. The right knee and thigh are in same coronal plane as the body. This is a normal or negative Patrick test in right hip.



Fig. 6. The left heel is on the right knee. The left hip is flexed but cannot be abducted or externally rotated. This is a positive Patrick test of the left hip and indicates disease.



Fig. 7. Same individual as depicted in Figs. 5 and 6. Normal hip flexed until the thigh lies on the abdomen. This fixes the pelvis so that spine motion cannot compensate for loss of hip motion. Using this maneuver the left hip is seen to have a flexion deformity of 45 degrees. Rotation and abduction adduction motion is absent.

vidual case, many factors must be considered. For purposes of clarity, the several methods of treatment giving the best results will be presented with their indications and contra-indications.

Resection of the obturator nerve for the treatment of degenerative disease of the hip was described first in 1933 by Camitz of Sweden.[5] Camitz observed veterinary surgeons performing resections of sensory nerves in the hoofs of horses and thought of applying the same principle in the treatment of human hip joints. Subsequently, Tavernier[6] published the results of denervation of the hip joint with section of the obturator nerve and of the nerve to the quadratus femorus muscle on the posterior aspect of the joint. Tavernier reports a series of 24 cases with 17 excellent results, 5 fair and only 2 complete failures after two years. Padovani,[7] 1947, extended the operation to include the branches of the femoral (anterior crural) nerves and stated that in this way, complete denervation of the hip joint was obtained. Obletz,[8] 1948, obtained satisfactory relief in 28 of 42 patients in whom abdominal section of the obturator nerve, together with a resection of the quadratus femorus nerve, was carried out.

Obturator neurectomy is an ingenious addition to the armamentarium of the surgeon in the care of degenerative hip disease. It possesses the tremendous advantage of being widely applicable. The procedure is accomplished extraperitoneally and intrapelvically under spinal anesthesia. The patient may be ambulatory the next day. The operation is little more shocking than is the ligation of a varicose vein. Hospitalization will average less than four days so that economically the procedure is within the reach of many who cannot afford the expense of an arthroplasty or arthrodesis. Obesity, although it enhances the technical difficulties, is not a contra-indication. As the patient can be active without pain, dieting is more practical. For those persons who refuse an arthrodesis and those with neither the temperament nor ability to cooperate sufficiently for arthroplasty, the obturator neurectomy may give complete relief. In fact, we believe a neurectomy is indicated first in any painful hip. Should it suffice, the problem is solved. Should the pain return or fail to be relieved, either the arthrodesis or arthroplasty then may be accomplished.

Section of the obturator nerve is best performed intrapelvically and extraperitoneally, as described by Chandler.[9] Using a Phannenstiel incision in the lowest transverse skin crease just above the pubic, the anterior sheath of the rectus abdominalis muscle is exposed. The sheath is slit vertically in the center of the distal portion of the muscle. The lateral portion of the rectus sheath is reflected and the lateral borders of the muscle defined and retracted medially. The index finger follows the posterior sheath to the attachment to the horizontal ramus of the pubis and then more deeply and laterally displacing the bladder and peritoneum posteriorly until the obturator nerve is palpated as it lies in the pelvic wall. Flat, lighted retractors are inserted and the nerve picked up and stimulated for purposes of identification. A section of the nerve is removed between ligatures.

Case Reports

Case 1. Mrs. T.A.O., age 56, a large obese white female, complained of gradually increasing low backache and pain in her right thigh and knee of five years duration. The discomfort was aggravated greatly by activity and relieved by rest. The leg ache was not aggravated by coughing. Neurological examination was negative. During recent months, the patient had rested poorly at night because the back and leg ache would awaken her. The intensity of the pain often necessitated her getting out of bed for relief.

Examination of the lower back revealed considerable increase in the lumbar curve. Spinal movements were associated with mild discomfort. Paravertebral muscle spasm was absent. The gait was characterized by a marked limp. The pelvis tilted forward acutely with each step, throwing a strain on the lumbo-sacral joint. The range of motion in the left hip joint was within normal limits. There was marked restriction of motion of the right hip joint. The Patrick test was positive. The left femur was flexed 45 degrees and all attempts to move it through as much as 10 degrees in any direction caused the patient to complain bitterly of pain.

Roentgenological examination showed degenerative disease of the right hip joint with similar changes involving the lower back.

On September 15, 1948, the patient was operated upon and an obturator neurectomy performed. The results were spectacular. The flexion deformity disappeared upon the operating table following severance of the obturator nerve. The patient was ambulatory the first postoperative day and went home the fourth. She was relieved completely of all night pain in back and leg. The range of motion in the hip joint was increased considerably and entirely painless. A barely perceptible limp remained. When last seen, the patient's back ached only occasionally.

The obturator is a mixed nerve. Neurectomy, therefore, eliminates painful stimulae that pass from the hip centrally over the obturator nerve. Interruption of the motor fibers paralyzes the adductor muscles and releases the muscle spasm. In many instances the range of motion greatly will increase as it did in this patient. With the correction of the flexion deformity the lumbo-sacral strain was eliminated and the backache greatly relieved.

Destruction of the entire nerve supply to a joint has been known to result in the development of a so-called Charcot joint.[4] Attempts to produce Charcot joints experimentally in animals by sectioning the posterior roots has failed, universally, except when trauma to the joint was used in conjunction. The best evidence favors the view that a Charcot joint is the aftermath not of some trophic disturbance of the bone as the result of cutting the nerve supply but, rather, is a degenerative change. This change results from oft repeated trauma. It is the lack of proprioceptive sensation, that results in an un-

usual amount of trauma and as the joint is painless, it lacks this protective factor.

Arthroplasty is a technically difficult, painstaking, shocking surgical procedure, requiring prolonged hospitalization and postoperative physical therapy. Patients should be selected carefully with particular reference to their age (chronological and physiological), temperament, musculature, occupation, and the nature of the hip deformity. In certain well selected cases, arthroplasty gives ideal results. A painful hip with a fixed deformity may be transformed into one which will have painless motion. The only absolute indication for arthroplasty is bilateral hip disease in which motion in both hips is lost or may be anticipated.

The vitallium cup technique generally is considered superior to other types. The technique commonly in use is that described by Smith-Peterson.[10] This author recently reported 600 cases without a death. As the originator of the procedure, he perhaps is overly enthusiastic, feeling there is no indication for either an arthrodesis or osteotomy. Bickel[11] in a recent review of the cases operated upon at the Mayo Clinic reported slightly more than 50 per cent of the results as very good or good and 26 per cent as poor. The greatest percentage of good and very good results was obtained among the middle-age group.

Case 2. A small white male had experienced gradually increasing pain, limp and restriction of motion in his left hip over a period of eleven years. During the last year, the pain had become so intense he had quit work. Despite his use of a crutch and relative inactivity, he was miserable most of the time.

Examination revealed the essential pathology limited to the left hip. All attempts at active or passive motion caused the patient to complain bitterly. Some motion was present but because of pain and muscle spasm, accurate evaluation was impossible.

As the patient was a slender male who was eager to regain motion in his hip, an arthroplasty was advised. Fig. 8 shows the postoperative roentgenographic examination. This was an excellent result. All pain was eliminated, patient walked with a barely perceptible limp. Motion was through an arc from zero or complete extension to 110 degrees of flexion; about 20 degrees of internal and external rotation was present. This patient is delighted with the end result. The possibility exists, however, that an equally satisfactory result might have been obtained with an obturator neurectomy.

The indications for arthrodesis of the hip in degenerative disease are: (1) failure to relieve pain by means of a lesser surgical procedure, (2) unilateral hip disease with the configuration of the joint such as to preclude arthroplasty, (3) occupational requirements placing a premium upon a painless, stable hip, (4) willingness of the patient to accept a stiff hip. Arthrodesis is contraindicated with significant degenerative disease of the spine or other hip.

Intra-articular arthrodesis is a formidable surgical procedure and the patient must be selected carefully so as



Fig. 8. Vitallium cup arthroplasty. Considerable new bone in region (A) from which glutii muscles were stripped. Patient has range of motion almost equivalent to his right hip. Motion painless and no limp. An excellent result.

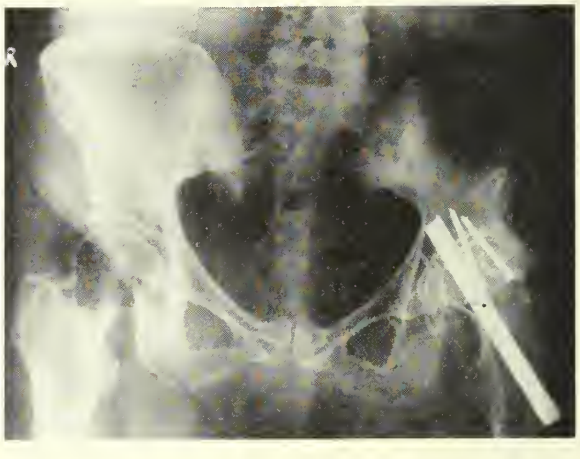


Fig. 9. Arthrodesis of the left hip. The cartilage was removed from the acetabulum and head of femur and internal fixation accomplished using a 6-inch Smith-Peterson nail and two screws. No external fixation was used. The above film was taken eight months after operation.

to eliminate poor surgical risks. Campbell[12] disadvises its use after age sixty. Watson-Jones[13] used a long Smith-Peterson nail without intra-articular fusion and without postoperative fixation in those patients whom he

considers as poor surgical risks or beyond the age limit suitable for intra-articular fusions.

Solid fusion of the hip is slow to occur regardless of the nature of the underlying disease. We prefer the technique of intra-articular fusion, using the Smith-Peterson arthroplasty approach and fixation by means of a long Smith-Peterson nail (Fig. 9). Two additional screws inserted at right angles to the pin will immobilize the hip completely. Casts are unessential and the patient can be ambulatory with crutches in three weeks.

Case 3. Mrs. G. S., age 57, had experienced gradually increasing pain in her left hip, thigh and knee over a period of eight years. The pain was aggravated by activity and relieved by rest. When first seen at the Northwest Clinic, she was totally incapacitated by pain, unable to walk except with a crutch and then only short distances. She was very nervous and irritable, a change that was attributed by her to inability to rest at night because of leg ache.

Examination revealed the significant changes were limited to the right hip. There was marked restriction of motion. A fairly fixed flexion deformity of 30 degrees, adduction of 20 degrees and external rotation of 20 degrees were present. The patient walked with a crutch and obviously suffered acute distress whenever she changed position.

Roentgenographic examination revealed findings typical of degenerative disease of the right hip.

As the patient was 57, obese and extremely nervous and irritable, an arthrodesis of the hip joint was advised. This was accomplished and the postoperative results are seen in Fig. 8. The patient had an excellent result. She completely was relieved of all pain and resumed her normal duties as a housewife with a barely perceptible limp. This is an excellent result and the patient is very well satisfied. In lieu of our experience with the obturator neurectomy, however, we now would advise it be accomplished first.

This patient spent seven weeks in the hospital. It was two months after she went home before she was able to resume her usual duties. Comparison of the economic aspects of the foregoing procedure with those of the usual obturator neurectomy which requires only four days in the hospital are all in favor of the latter.

Summary

Degenerative disease of the hip is a common cause of painful limp. A review of the clinical, pathological and roentgenological findings in such cases briefly is presented. The surgical treatment is outlined. The use of the obturator neurectomy in lieu of so-called conservative management is urged. Indications and contra-indications with illustrative cases are presented for obturator neurectomy, arthrodesis and arthroplasty.

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DEPARTMENT OF HEALTH ON THE AIR

The Minnesota Department of Health inaugurated its first regular series of radio programs on Monday, February 14. The programs will be given at 11:15 every Monday morning over Station KUOM in the Twin Cities.

Dr. Robert N. Barr, chief of the Health Department's Section of Maternal and Child Health, has taken over the KUOM radio spot left vacant by the departure of Dr. Donald A. Dukelow for a position with the American Medical Association in Chicago. Dr. Barr was introduced to his radio audience by Dr. Dukelow on the broadcast of February 14.

Dr. Barr's program subjects for March will be: March 7, It's Your Health Department; March 14, Health Days and Health Councils; March 21, Why Vital Statistics? March 28, Tracking Down Epidemics.

A Study of Congenital Malformations

Robert E. Lucy, M.D.

Jamestown, North Dakota

CONGENITAL malformations are a problem with which every physician, especially the obstetrician, has to deal. Usually one of the first questions parents ask is, "Is the baby all right?" Even though the mother has been reassured, it is not uncommon to see the mother inspecting the baby and counting the fingers and toes when she sees the baby for the first time.

If a physician delivers a baby with some type of abnormality, he is immediately confronted with the questions as to the cause of the malformation and whether any other children born of these parents will be malformed. In the past there was little the parents could be told regarding the cause of malformations. The parents were usually informed that these things happened occasionally and they need not fear having any other babies with malformations.

However, the very thorough work of Dr. D. P. Murphy [1] has recently given us more scientific facts by which we can answer the parents. Dr. Murphy's work included a five year survey of all deaths between January 1, 1929, and December 31, 1933, in Philadelphia, Pennsylvania. A total of 130,132 death certificates was analyzed; and of these, 1476 recorded congenital malformations. Personal interviews with the mothers of some 546 of these were carried out and a five page questionnaire was filled out concerning the health of both parents, history of all previous pregnancies, economic status, type of diet, etc. As a result of this work, Dr. Murphy found that there were "47 births of malformed infants per 10,000 of all live births in Philadelphia, or a ratio of 1 in 213."

He also showed "that in a family possessing a malformed child, the birth of a subsequent malformed offspring takes place with a frequency that is 25 times the general population." [1]

A significant point that Dr. Murphy brought out in this work was that environmental factors that he investigated did not play a significant role in the etiology of malformations found in the random sample of population. The malformations were genetic in origin and were from factors inherent in the germ cells prior to fertilization. However, he did show that after fertilization has taken place congenital defects may be produced either by the action of therapeutic amounts of maternal, pelvic radium or roentgen irradiation or by a maternal attack of rubella. He believes that any pregnant woman who has has an attack of rubella or has undergone X-ray or radium treatment in pregnancy should be aborted.

[1]Murphy, D. P., M.D.: *Congenital Malformations*: Lippincott & Co.

A study of this problem at Ball Memorial Hospital in Muncie, Indiana, was carried out. The object was to see if the rate of congenital malformations as evidenced at birth or shortly thereafter was greater than that previously reported based on death certificates (see Table 1.)

TABLE 1

Nervous System Diagnoses:	
Anencephalic and spina bifida	13
Hydrocephalus	17
Spina bifida	15
Hydrocephalus and meningocele	3
	48
Defects in Gastro-intestinal Tract:	
Congenital hypertrophic pyloric stenosis	12
Congenital stenosis of esophagus with tracheo-esophageal fistula	1
Atresia lower ileum	1
Congenital atresia of esophagus	1
Malrotation of the bowel	1
Imperforate anus	1
	17
Cutaneomusculoskeletal System Defects:	
Harelip—cleft palate	15
Polydactylism	9
Club feet	35
Hernias	37
Absence of leaf of diaphragm with hernia	2
Congenital absence of bones of arm or hand	3
Syndactylism	2
Intrauterine amputation of fingers	2
	105
Cardiovascular Defects:	
Congenital heart	20
Congenital anomaly of left subclavian artery	1
	21
Genito-urinary System Defects:	
Horseshoe kidney	1
Past insertion of renal pelvis	1
Hydrocele	3
Hypospadias	6
Absence of kidney and ureters	1
Deformed bladder	1
Undescended testicles	5
Congenital hypoplasia of kidney	1
	19

The situation was ideal in that the hospital was the only one in a town of 50,000 with even a larger drawing territory of the entire county. For the basis of study, birth records, reports to the State Board of Health, admission to the pediatric and pediatric surgery department, and reports of autopsies on stillbirth and neonatal deaths were used. The greatest majority of all births in this county are in the hospital. Any malformation

not evident at birth but that required further hospitalization would be in this hospital. Examples of such deformities are congenital heart disease, hernias, and congenital hypertrophic pyloric stenosis.

It is believed that the congenital malformations reported on this basis give a more accurate picture of the incidence of congenital deformities.

All the birth records between January 1, 1942, and December 31, 1947, were reviewed as well as the admissions to the hospital of patients who had been born there and were later hospitalized for treatment of congenital defects. During this period there were 11,881 births in the county and of these 10,751 were born in the hospital (see Table 2). There were 210 congenital defective babies present in this series or a percentage of 1.77 for the county. However, of the 210 births only 176 were live born (22 of these lived from 15 minutes to as long as six weeks before expiring). If we count all the congenital malformations (210) for the 10,751 hospital births the percentage is 1.95 or by counting only the live births (176) the percentage is 1.64 or an incidence of one congenital defect in 61 live births. This is almost four times as many congenital defects per 10,000 as previously reported. Another interesting fact revealed in this survey was the five sets of twins with similar defects. A point that must be considered in comparing the discrepancy between the incidence of malformation in this report and Dr. Murphy's is that Dr. Murphy's were taken from death certificates. A large portion of the deformities found in this study were not fatal and were correctible, such as cleft palate, hare lip, club feet, all types of hernias, hydroceles, hypospadias, undescended testicles and hypertrophic pyloric stenosis. When this is taken into consideration even though the incidence of congential defects is high, the outlook for the majority of babies with anomalies is good.

In summary, as a result of these surveys, when a physician is questioned by the parents of a malformed baby he can inform them that anomalies occur in ratio of 1:61 live births, and that a large percentage of these defects are correctible. Another fact the physician should ascertain is whether or not the mother was subjected to therapeutic amounts of X-ray or radium during pregnancy or if she had an attack of rubella during pregnancy. If she has, then he can tell her that the X-ray, or radium or rubella was probably the cause of the malformation and other children would not be affected in any greater proportion than the general population. However, if the defect is genetic in origin, then the physician should inform the parents that any subsequent children are 25 times more likely to be defective than children whose parents have never produced a malformed baby.

Table 2

Year	1942	1943	1944	1945	1946	1947	Total
Total county births	1,925	1,855	1,841	1,688	2,099	2,473	11,881
Home deliveries	447	272	180	104	76	51	
Total number of malformations	33	26	26	36	37	52	210
Live malformed infants	26	20	19	30	33	48	176
Percentage of total malformations	1.71	1.40	1.41	2.13	1.76	2.10	1.77
Hospital births	1,478	1,583	1,661	1,584	2,023	2,422	10,751
Percentage of hospital malformations	2.23	1.64	1.57	2.27	1.83	2.15	1.95
Stillbirths	7	6	7	6	4	4	
Corrected hospital percentage (malformed percentage of live births)	1.76	1.26	1.14	1.89	1.63	1.98	1.64
Twins	1	0	0	3	1	0	

U. OF M. COURSE IN PROCTOLOGY

A course in Proctology will be presented at the Continuation Center for one week starting April 16. The course is intended for doctors of medicine who are engaged in general practice. Emphasis will be placed upon those aspects of proctology which are of particular concern to the general physician. Presentation will be by means of lectures, discussions, motion pictures and operating room demonstrations. Enrollment will be limited to 20.

Practical Aspects of Allergy

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NUMEROUS investigators have estimated the incidence of allergic disease in the general population at from 10 to 50 per cent. Even assuming that the minimal figure is correct, it is apparent that the physician is called upon to diagnose and treat a large number of patients with allergic manifestations. Naturally, the form of allergic disease encountered in practice will vary somewhat with the geographical location, industrial status, age level, and other factors. Neverthless, a wide range of allergic entities from simple hives to severe asthma is certain to be seen frequently.

The unfortunate sufferer with an obscure allergic disease is often shunted around, and the allergic nature of the disease is not recognized. All too frequently the relatives and the physician have a tendency to regard these patients as harboring a neurosis. Conversely, a danger nearly as great lies in the course of treating all comers as being allergic. There has been widespread acceptance of the theory of histamine release in the causation of allergic symptoms. Concurrently with this acceptance, there has developed a glowing enthusiasm for the histamine-antagonist drugs which offer for the first time a new era of palliative relief for the allergic patient.

Faulty handling of the allergic individual is usually the result of one of two common errors: (1) Busy clinicians are prompted by the ease of treatment to prescribe one of the antihistaminic drugs. The patient receives some symptomatic relief and no further study is made. (2) One of the stock diagnostic sets prepared by a pharmaceutical house is utilized and a few desultory tests are made. This frequently results in arriving at the erroneous conclusion that the patient is not allergic or that he is sensitive to one or more allergens which may or may not be of clinical significance. The allergens actually responsible for the patient's symptoms are often omitted in testing for sensitivity.

Either of these courses precludes a satisfactory outcome. Allergists have long recognized that the successful management of the allergic state is only achieved through exact coordination of the diagnostic and therapeutic factors. Any course short of this end may well result in undeserved discredit to the entire field of allergy. The goal of permanent relief of distressing symptoms and the prevention of irreversible pathologic change in shock tissues should not be sacrificed simply for immediate symptomatic relief. It is easy to condemn the negligence of a physician for allowing a child's appendix to perforate. The responsibility is no less for failure to investigate and treat the mild allergic manifestations in childhood which become severe and intractable in later life.

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Allergy is a serious and dangerous disease. Neither the diagnosis nor the treatment should be undertaken lightly in view of the reports of deaths due to the use of potent extracts which run through the literature in an endless stream. When a fatal allergic reaction occurs it is a sudden and unwelcome visitor. It is the purpose of this paper to attempt a practical approach to the field of allergy; and to formualte certain general principles which it is believed the physician can utilize to make his allergic investigation more accurate and the treatment less hazardous.

The Mechanism of Allergy

The most popular concept of the mechanism of allergy conceives of an allergen-antibody reaction. Allergens enter the host as inhalants, ingestants, injectants or contactants. The allergen (antigen) arrives in the "shock" tissues in which a large amount of antibody is already present. If the antibody is present in the "shock" tissues in sufficient quantities, reaction symptoms occur. These symptoms are generally regarded as due to the liberation of histamine as a result of cell injury by the antigen-antibody reaction. Why this reactions takes place is a phenomenon as yet unexplained.

Etiology

The three main etiological factors will be considered briefly: (1) The constitutional basis. (2) The exciting elements. (3) The contributory factors.

Of these three, the constitutional factor is of the greatest importance. Allergic individuals show a familial history of allergy in 60 to 70 per cent of cases. The disease itself is not inherited, only the tendency to allergic disease. If the person with a constitutional tendency to allergic disease were never to come in contact with proteins of high allergenic potential, allergic disease would be minimal. Since this is obviously impossible, it follows that repeated contact with exciting factors such as wheat, eggs, ragweed pollen, etc., first sensitize the allergic individual and subsequently bring on attacks when the antigen is introduced into the host in sufficient quantities to cause a reaction.

However, the constitutionally allergic individual who has been sensitized to an allergen such as dust, eggs, or wheat may have no allergic manifestations even when subsequently exposed to these exciting agents. It may be necessary for the contributory factors such as heat, light, cold, fatigue, nervous exhaustion or bacterial infection to break down the patient's resistance before an allergic attack may be launched.

Diagnosis

Of first importance is the preliminary processing of the individual. Frequently the apparent absence of or-

ganic disease invites a snap diagnosis of an allergic condition with the subsequent prescribing of a histamine-antagonist drug. That this is a serious error is evident without elaboration.

A history that is thoughtful without necessarily being unduly detailed will usually avoid this difficulty. Certainly the first and most important requisite in the diagnosis of allergy should be a history covering the following essential points:

1. The Patient:
   a. Present Complaint: with particular reference to mode of onset of attacks; duration and means of alleviation, if any; night or day; seasons of the year; aggravated by being inside or outside; suspected cause as horses, grain dust, feathers, plants, foods, etc.
   b. Past History: Inquiry should be made particularly of infantile eczema, hay fever or asthma, food or drug idiosyncrasies, frequent colds, sinus trouble, migraine or gastro-intestinal upsets as manifested by gas, belching, heartburn or diarrhea; cold, heat or light sensitivity.
2. The Environment:
   a. Inquiry should be made in regard to the home: type of heating, rugs, plants, mattresses, pets, etc.
   b. Occupational exposures: dust, plants, gas, chemicals, animals, paints, etc.

Frequently when the essential points of the history have been summed up, it is found that the patient complains of many minor symptoms. Usually this is a rather strong indication that this individual is allergic. Often a patient with allergic rhinitis also has occasional attacks of hives, migraine, or vague gastro-intestinal symptoms.

After the history has been taken it should be thoughtfully reviewed. If it appears probable that the disease is allergic in nature, jotting down a few notes will assist in determining the causal allergens. For example, the patient has asthmatic symptoms worse during the warm summer months but extending well beyond the season for ragweeds, sagebrush, and pigweed. Further inquiry indicates that his symptoms begin too early for weed pollens and *later than one would expect symptoms to develop from either grass or tree pollens.* The patient states that he feels better while indoors but his symptoms are aggravated by harvesting operations. His symptoms are entirely relieved while snow is on the ground. These salient points taken from the history give a strong indication that the patient may be sensitive to one or more of the common seasonal fungi.

The importance of close attention to the details of the history is well illustrated by the following case history:

A. H., aged 16, student, came to the Clinic complaining of asthmatic attacks and nasal symptoms. Onset was late in the summer, usually about August 1, and continued until November or later. His symptoms were always severe in summer but were never present in the winter. Usually they were very much aggravated by being around haying or threshing operations. As a general rule he suffered more outside of the house than inside. Complete testing was done. Positive reactions to the following were found:

Cottonseed	Hormodendrum
Mustard	Blue grass
Peas	Russian thistle
Strawberry	Short ragweed
String bean	Giant ragweed
Yeast	Ash
Orris root	Cottonwood
Grain mill dust	Oak
House dust	Orchard grass
Alternaria	Pigweed
Sagebrush	

Comment: This patient had been tested and treated previously to ragweed extract with poor results. The history clearly implicated the molds due to continuation of symptoms long beyond the usual termination of the pollen season. Attention was also directed to the molds by the fact that proximity to haying and threshing operations aggravated his symptoms. A successful therapeutic result was achieved in this case by adding the proper mold extract to the pollen mixture.

It has been repeatedly shown that a careful history is more important in the diagnosis of allergy than are skin tests. Often the history will arouse a strong suspicion that certain allergens are responsible for the symptoms. In this case, skin tests frequently confirm the diagnosis.

The following case history again illustrates the importance of close attention to the details of the history. In this instance the story told by the patient strongly suggested sensitivity to non-seasonal molds.

Mrs. O. F., aged 34, farm housewife, came to the Clinic complaining of cough, sneezing and wheezing. She was usually somewhat worse in the summer but her symptoms persisted the year around. She was definitely made worse by house dust and dust from wheat flour. Her symptoms were usually greatly aggravated by going into the basement or attic. Complete testing revealed the following positive findings:

Tomato	Hormodendrum
Aspergillus niger	House dust
Aspergillus fumigatus	

Comment: In this case the history definitely placed house dust and the molds high on the list of suspects. Failure could easily have resulted, however, if testing to pollens and common miscellaneous inhalants and foods had not been carried out.

Having completed the history, the main allergens suspected may be listed and further confirmation made by means of skin tests. It is the consensus that skin tests are far from being infallible. However, in spite of the absence of uniform standardization of allergic extracts, false positive reactions, and numerous other difficulties, the practice of skin testing is by and large the most practical and satisfactory method available for the confirmation of suspected sensitivities.

Numerous other diagnostic methods are available, among them the elimination diets, determination of leu-

cocytic index after ingestion trials, nasal, ocular and other tests. It is generally agreed that they all have their proper place. They may be used to good advantage by the clinician seeking to diagnose an allergic disease. However, in a large number of cases, carefully planned, executed and interpreted skin tests will give reasonably satisfactory results.

At this point, it should be strongly emphasized that only failure can result from allowing pharmaceutical firms to do the thinking. Each case should be carefully individualized and tested accoridng to the particular needs of that individual.

Testing is desirable and valuable only if done thoughtfully, keeping in mind the history given by the patient. It is extremely important, for example, to know what allergens the patient is apt to be subjected to. A few desultory tests are worse than useless because all they do is discourage both clinician and patient, and do not reveal any significant facts. It is highly desirable, for instance, for the physician to study the situation in his own locality, making his own chart of the prevalence of certain inhalant allergens at specific times of the year. There is little to be gained testing patients who reside in the prairie states with caddis fly (normally appearing in great numbers along the shores of Lake Erie.)

A practical point of considerable importance in the interpretation of the tests is the fact that positive tests must be shown to be of clinical significance. This can usually be demonstrated without great difficulty. This point is well illustrated by the following case history:

E. F., aged 21, female, complained of recurrent attacks of abdominal pain. She had had an appendectomy prior to being seen at the Clinic. Her history was not enlightening from the standpoint of the ordinary causes of pain. A complete physical examination was negative. Laboratory examinations, including colon X-ray, gastro-intestinal study, and cholecystogram were all negative. Finally, after a careful review of her case history, she was given a thorough allergic investigation. Skin tests revealed sensitivity to lettuce which has repeatedly been confirmed as the causal allergen by clinical trial.

Again illustrating the same point is the case of a school girl, aged 10, who repeatedly refused to go to school because of abdominal pains. During these attacks she was exceedingly unruly and her mother was at her wit's end to know what to do with her. She would lie in bed and refuse to get up. She whined continuously and became more and more irritable. Routine complete physical and laboratory examinations were entirely negative. A review of her dietary habits revealed that she was eating large quantities of chocolate. An allergic investigation revealed marked sensitivity on skin tests to chocolate and several other common foods. The offending foods were withdrawn from her diet with complete alleviation of her symptoms. They were returned again one at a time until she was given chocolate, at which time her symptoms returned. Chocolate and cocoa in all forms were immediately removed from her diet and since then the child has been well and happy and makes no objection to going to school.

While there is considerable difference of opinion as to which foods and inhalants should be included in a thorough survey of an allergic condition, the following common causal allergens are routinely included in our Clinic:

Foods

Milk	Fish	Peanut
Egg white	Banana	Buckwheat
Egg yolk	Lamb	Coconut
Wheat	Peas	Cornmeal
Oats	Carrots	Cottonseed
Rye	String beans	Celery
Chicken	Chocolate	Cantaloupe
Orange	Spinach	Navy beans
Tomato	Salmon	Potato
Beef		Pork

Pollens

Short ragweed	Pigweed	Mixed oak
Giant ragweed	Russian thistle	Cottonwood
Bluegrass	Sagebrush	Boxelder
Cockleburr	Timothy	Elm

Molds

Alternaria		Aspergillus fumigatus
Hormodendrum	Penicillum	Aspergillus niger

Miscellaneous

Cotton	Goose feathers	Orris root
Chicken feathers	Glue	Pyrethrum
Cat dander	Goat hair	Rabbit hair
Cow dander	Horse dander	Sheep wool
Dog dander	House dust	Hog hair
Duck feathers	Kapok	Camel hair

As a routine measure it will be found satisfactory in most cases to test with *Alternaria* and *Hormodendrum,* omitting *Helminthosporium.* This is possible because of the low atmospheric concentration of the latter spore and also due to the fact that generically and antigenically it is closely related to the common molds—*Alternaria* and *Hormodendrum. Aspergillus* should be included in all routine testing because of its well-known wide occurrence, and also because it has no specific seasonal occurrence. It has been frequently incriminated as causal in the production of perennial asthma or rhinitis especially in patients living in old, damp houses or with old furniture. Two strains of *Aspergillus* are included because of their relative importance and the fact that *Aspergillus niger* is not closely related either antigenically or generically to the *fumigatus* species. It is important to emphasize at this point that the previously listed allergens are not the only molds or miscellaneous inhalants used. Usually this should be the minimum number used in any suspected case of inhalant allergy.

The physician, after a careful review of the case, may make his own selection of allergens from the lists as given using one of the groups or part of each according to the needs of the individual case. In general, it may be said that if a patient does not react positively to any of the foods listed, there is very little chance that he is a food sensitive case. The same may be said for the pollens, molds, and miscellaneous inhalants. It must be

remembered, however, that this is only true *in general*. No rule is without exception. Cases are on record of asthma being due to sensitivity to pigeons alighting on the window sill of a patient's room, with no other known sensitivity.

Two schools of thought exist today with widely divergent opinions as to the relative merits of the scratch tests versus the intracutaneous. In our Clinic we have adopted a routine procedure in which scratch tests are applied first, followed by intracutaneous, nasal, ocular, or passive transfer only when the scratch tests are confusing or inconclusive. The most satisfactory results can be obtained, and the dangers minimized, by adhering to a rigid policy which should encompass the following suggestions:

1. In the absence of considerable clinical experience with allergenic extracts, sets of intradermal tests which are made up of groups of allergens should be avoided. Dangerous, even fatal, accidents can occur from the injudicious use of such extracts when injected intradermally in a highly sensitive host.

2. Individual cutaneous (scratch) tests present a wide margin of safety. For the novice, they are the most satisfactory, and with some practice can be applied with amazing rapidity. Usually excellent results can be obtained by testing first with a few inhalants such as the ragweeds. Since there is a high incidence of ragweed sensitivity, the occurrence of large wheal reactions forewarns the clinician that he is dealing with a hypersensitive individual. His subsequent investigations thereby are to be made with caution. He is forewarned to split his groups, lending special caution to known highly allergenic substances such as cottonseed, fish, meats, etc.

3. The intradermal method is best avoided unless the clinician wishes to confirm previous positive scratch tests or desires a more sensitive test in the event the cutaneous test proves negative to a highly suspicious allergen.

4. Intradermal tests should be scrupulously avoided in small children. These tiny allergic individuals are best tested by the scratch method. Subsequent intradermal and elimination studies may be made as indicated.

5. Intradermal tests are best never applied to any portion of the body other than arms or legs. Rapid absorption with edema and wheal formation and early evidence of constitutional reaction can be partially blocked by the prompt application of a tourniquet.

6. Severe hypersensitive individuals, especially asthmatics, should never be tested intradermally without preliminary evaluation by the cutaneous method.

7. The same meticulous care should be exercised to avoid mistakes in dilution of intradermal extracts as is used in measuring any potent drug. Labels should be clearly typed and firmly fastened to the vial. Technicians charged with the care of the extracts should be required to check labels and dosage before and after drawing the extract into the syringe.

8. Patients tested intracutaneously or treated with extracts should be required to remain in the physician's office under observation for at least twenty minutes.

Treatment

The subject of treatment may be conveniently divided as follows:

1. Preventive treatment
2. Specific treatment
3. Non-specific treatment

Much can be accomplished by aiming at the prevention of allergic disease. While not too feasible in actual practice, the fact remains that theoretically marriage between allergic individuals should be discouraged. When either parent exhibits allergic manifestations of any nature, the offspring are potentially allergic individuals.

In order to minimize the chances of sensitizing the infant, some investigators have advocated restricting the pregnant woman's diet in so far as this is consistent with the maintenance of health in pregnancy. This method of preventing allergy in the newborn, by having the mother avoid the ingestion of large quantities of known highly allergenic foods, has not, as yet, been proven too successful and has not been widely accepted.

The newborn infant, however, who is potentially allergic, presents a challenge to the physician, and the parents should be encouraged to place him under careful medical supervision. The necessary precautions should be taken to help him grow and develop naturally with adequate rest, fresh air and exercise and a balanced diet with ample minerals and vitamins. He should be put through his immunization program the same as any normal child. Nervous tension should be minimized, foci of infection eliminated, and care taken to avoid excessive exposure to highly allergenic substances such as pollens, dust, feathers, kapok, orris root, and the animal emanations.

Specific treatment consists of the elimination of the causal allergens as completely as possible, and hyposensitization with extracts of those which cannot be removed from the patient's environment. Hyposensitization is most successful when carried out on the perennial plan. After the patient has been advanced through his series of extracts of gradually decreasing dilution and has reached a maximum of the concentrated extract (generally 0.5 cc.), in most instances he may be reduced to a lower maintenance dose given at twice monthly intervals. The length of time an individual requires treatment is a matter only decided after careful consideration of each case.

Emphasis cannot be placed too often on the fact that satisfactory results cannot be achieved by treatment which is not specifically individualized. If the patient has been completely studied and adequate testing performed, concomitant sensitivities have been discovered. For example, an individual sensitive to ragweed who has milder symptoms during the season when ragweed is not prevalent in his locality, will not get a satisfactory therapeutic result unless he is treated also for sensitivity to other inhalants to which he may have shown positive reactions.

Foods may be of great importance, perhaps representing the major allergens in a given case. They should defintiely be withdrawn when they react positively unless it is well known that they are not of clinical significance. Having been withdrawn, they should be returned one at a time under careful observation, thereby establishing the clinical accuracy of the skin test.

Multiple sensitivities are not uncommon. Hay fever patients especially often show positive reactions to many foods and inhalants to which they are clinically sensitive. A grievous blunder may easily be committed by failure to test to all the common pollens as well as to all the ordinary inhalant allergens to which the individual is exposed. Frequently the symptoms of hay fever patients are intensified during the pollen season by the ingestion of certain foods such as peaches, apricots, watermelon and cantaloupe. Hyposensitization without the elimination of secondary or minor allergens such as these may prove to be a complete failure.

Non-specific treatment consists of the therapeutic measures utilized when a specific cause cannot be discovered or when the usual specific treatment has proven to be a failure. It is essential, of course, for the patient to have a proper diet, adequate rest, elimination of foci, and abundant vitamins. Worry, overwork, and nervous tension should be avoided. Psychotherapy frequently has proven beneficial.

SUMMARY

A brief review of the subject of allergy with special emphasis on some of the practical aspects of diagnosis and treatment has been presented.

NORTH DAKOTA PROVIDES FOR THE DISPLACED PHYSICIAN

Provisions for placement of a limited number of Displaced Physicians were made in Grand Forks. The announcement was made by Dr. O. W. Johnson, Rugby, President of the North Dakota State Board of Medical Examiners. Dr. Johnson said that not to exceed eight Displaced Physicians per year for three consecutive years would be permitted to take the State Board Examinations for a temporary license after first serving a general internship for one year in North Dakota Hospitals approved for that purpose. Dr. Johnson pointed out that inasmuch as the accredited social agencies which sponsor D.P.'s are responsible for D.P.'s until they have attained citizenship, the temporary licenses will be valid only in the community where the Displaced Physician has been located by the Sponsoring Agency. "When the Displaced Physician is granted his final citizenship," said Dr. Johnson, "he will be granted full license upon review by the State Medical Board."

It was explained by Dr. Johnson that several difficult problems had to be overcome in making the above arrangements. "The sole responsibility of the State Medical Board is to make sure that only doctors of high professional standings and good moral character be permitted to practice in North Dakota," said Dr. Johnson. He pointed out that "in the case of these Displaced Physicians no records of medical education, medical attainment or credentials are available to help the Board in their determination." He said, "the Board nevertheless feels that as much as possible should be done to help out the worthy among these unfortunate persons who have been forced, by circumstances, to live in D.P. camps in Europe." We think that with the supervision now provided that the people in North Dakota may be safely protected, and the year's internship will provide a period of adjustment during which the Displaced Physician may learn the English language, American customs, and refresh himself in the advancement in Medical Science as practiced in the United States.

RESOLUTION AS ADOPTED BY THE NORTH DAKOTA STATE BOARD OF MEDICAL EXAMINERS JANUARY 6, 1949

It was moved that a total of not to exceed eight (8) Displaced Physicians per year for a period of not to exceed three (3) consecutive years who have been sponsored by accredited social agencies be permitted to take the State Board Examinations for a temporary license after first serving a year's general internship in a North Dakota hospital, such internship to be approved by the State Board of Medical Examiners. This temporary license is only valid at the location designated by the sponsoring group and approved by the Board of Medical Examiners. This temporary license shall apply only to Displaced Persons as defined by the current Act of Congress. When the Displaced Physician attains full citizenship, the temporary license may be made permanent by the action and approval of the State Board of Medical Examiners.

Treatment of Acute Cholecystitis

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Approximately five years ago one of us had occasion to observe two patients suffering from acute cholecystic disease develop serious complications because of a policy of delay in instituting surgical treatment. They are reported briefly as follows:

Case 1. Mrs. J. E., age 60, was first admitted to St. Luke's Hospital on February 14, 1943, with a two-day history of upper abdominal pain suggestive of acute gallbladder colic. Some nausea had been present but no vomiting. Her pain had been severe and required several hypodermics for relief. The pulse, temperature, and respirations were within normal limits. The blood pressure was 150/90. No abnormalities were noted on physical examination except for slight epigastric tenderness. Neither muscle spasm nor palpable mass was present. Routine urinalysis was negative. The red blood count was 4,980,000. The hemoglobin was 14.8 gm. and the leukocytes numbered 16,450, 82 per cent of which were neutrophiles. A diagnosis of acute cholecystitis was made and conservative treatment instituted. In three days all symptoms and findings had subsided and her leukocyte count had returned to normal. She was discharged on a fat-free diet and advised to return for detailed studies. A cholecystogram one week later revealed a nonfunctioning gallbladder. Operation was advised but she elected to continue conservative handling since she was feeling well. She was readmitted on September 6, 1943, having been quite free from symptoms until two weeks prior to this admission during which period she had experienced repeated attacks of sharp upper abdominal pain. These attacks had been of short duration but had been present almost daily. She had noticed no chills or fever nor change in the color of her stools but the urine had been dark. On admission she was in severe pain and the conjunctivae were slightly icteric. The upper right abdomen was markedly tender, moderately rigid, and a sensation of a mass was present on palpation. The temperature was 100 degrees. Leukocytes numbered 22,600, 92 per cent of which were neutrophiles. A trace of bile was present in the urine and the icterus index was 20. A diagnosis of acute cholecystitis was made. Some improvement was noted in the next five days and the leukocyte count and temperature gradually subsided to within normal limits. Suddenly the severe pain recurred. Chills were noted and her condition became markedly worse. She was explored through a right subcostal incision under local anesthesia, supplemented with a small amount of sodium pentothal. An abscess was encountered between the liver and the anterolateral costal margin and incised. Bile and necrotic material were evacuated. Following this she continued critically ill for one week after which gradual improvement was noted. She was out of bed and eating quite well by the fourteenth postoperative day when a severe headache developed. She also complained of vertigo and numbness in the left arm and hand. Rigidity of the neck was noted and paralysis of the left upper and lower extremities developed. A septic type of temperature curve was present. She died on the thirty-first postoperative day. Autopsy was not permitted. The cause of death was thought to be brain abscess, secondary to pericholecystic abscess.

Case 2. Mr. O. L., age 46, was first admitted to St. Luke's Hospital on October 10, 1942, with a twenty-four-hour history of recurrent colicky upper abdominal pain. Nausea was present and he had vomited once. The past history was non-contributory and this was his first attack of upper abdominal distress. Physical examination revealed a middle-aged somewhat obese white male in moderate distress. Positive findings were absent except in the abdomen where marked tenderness was present over the entire right abdomen but more marked under the right costal margin. Moderate rigidity was present. No masses were palpable. His temperature was 100 degrees, blood pressure 140/90. The pulse was 90 beats per minute and the leukocytes numbered 17,500. Urinalysis was negative. A diagnosis of acute cholecystitis was made and conservative therapy instituted. He improved gradually and by the fifth hospital day the temperature and pulse were normal. The white blood count was 7,500 and only slight tenderness was present under the costal margin. He was discharged on a fat-free diet. He remained symptom-free and a cholecystogram was made on October 26, 1942, sixteen days after the onset of his illness and it was reported as a nonfunctioning gallbladder. X-ray of the stomach and duodenum was negative. Surgery was advised but refused.

He was readmitted to the hospital four days later with recurrence of pain in the right upper abdominal quadrant. This time he did not improve. Moderate fever, leukocytosis and tenderness persisted. Ten days after this admission, a mass was detected for the first time beneath the right subcostal margin and a pericholecystic abscess drained on the twelfth hospital day. Following profuse drainage of purulent and bile-stained fluid, he gradually improved and was discharged on the fifteenth day after operation and the twenty-eighth day after admission. A draining sinus closed spontaneously two months later. Surgery was again advised but refused.

It was evident that there should be a better method of treating people with acute gallbladder disease than by simply watching them perforate. It is probably true that the majority of patients seen with acute gallbladder

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colic and even those with early acute cholecystitis will undergo spontaneous resolution of the acute phase of the disease with conservative management allowing a more accurate diagnosis and surgery at a more carefully selected time. There will remain the occasional fatality as recorded above under such a policy as well as the distressingly increased morbidity for often patients will spend two or three weeks in the hospital while waiting for the acute phase to recede only to return later at another period for the elective surgery. It should also be mentioned that under a conservative plan of treatment of acute cholecystitis an occasional subhepatic appendix may rupture and an occasional walled-off perforated peptic ulcer go undetected. If one pursues the plan of early operation for these cases, the exact procedure to be employed comes up for consideration. If cholecystostomy were to be employed frequently, the argument for lessened morbidity and lessened expense loses its force for it is quite generally conceded that the patient with cholecystostomy will commonly need cholecystectomy at a later date. However, it appears that cholecystectomy can be done with safety in almost every case. That operations can be done on patients with acute gallbladder disease with reasonable mortality rates is recorded in the recent literature.

During the past five years, largely as a result of the cases cited, we have advised early surgery in our patients with acute cholecystitis. We have become increasingly satisfied with this way of handling these patients and feel that a study of this material together with several cases similarly treated prior to this time would be worth reporting, particularly since it emanates from a small hospital.

Review of Recent Literature

The ramifications of the problem have been discussed at length in the literature. There is divergence of opinion on many points. All feel that while the diagnosis itself is seldom difficult, it is often extremely difficult to know how far the disease has progressed. There seems to be no clinical or laboratory procedure at present that will tell the surgeon when gangrene is present and perforation imminent. It is this fact that makes most surgeons today feel that on being confronted with a patient with acute cholecystic disease, it will save both himself and the patient possible serious trouble to relieve the condition surgically as soon as the necessary few hours have elapsed for the proper preparation. Best[1] reported 44 cases of acute gallbladder disease, one-half of which was treated by a conservative policy and the latter half treated by a policy of early surgical intervention, the author having changed his mind because of a distressingly high mortality rate in the first half. "The lack of parallelism between the pathology and the laboratory-clinical findings is often more astounding in acute cholecystitis than in acute appendicitis." He then quoted different authors who stated that acute cholecystitis if untreated will progress to gangrene, abscess, and perforation in from 10 to 30 per cent of cases. The total white count may fall to normal or even subnormal values in the presence of a progressive lesion of the gallbladder. Best feels that careful analysis of the differential count is more valuable. If the staff forms increase to over 10 per cent it is important. Thus, if the total white blood count is 6,000 but the staff count is 12 per cent, he then places three zeros after the 12 and arrives at a figure of 12,000 which he considers the total white count. This rule he feels is of considerable importance in all acute conditions of the abdomen.

Edwards[2] stated that the gallbladder will perforate in approximately 10 per cent of cases of acute cholecystitis and favors early operation in all cases. Eliason and Stevens[3] reported on studies made at the gastro-intestinal clinic at the University of Pennsylvania and found that biliary tract disease accounted for 40 per cent of all the cases seen there. Of these, 20 per cent were classified as the acute type. They feel that a true obstructive gallbladder disease of more than two days' duration will not subside under any treatment except surgery. The pathological state of a gallbladder cannot safely be estimated by any physical or laboratory test; hence, the danger of delay. They feel that if an acute cholecystitis patient is seen within twenty-four hours, one should operate immediately. As further emphasis on the failure to be able to correlate the pathologic state of a gall-bladder with the clinical and laboratory signs, Eliason and Stevens in 135 cases, found that the white blood count was normal in 21 per cent, the temperature was normal in 23 per cent. No mass was palpable in 30 per cent. Even local tenderness was absent in 4 per cent.

Saint[4] stated "It is true that the majority of patients will recover spontaneously from an acute attack of biliary disease, but knowledge that this is so may prove a dangerous possession." He disagrees with the statement so often quoted in the literature that there is often no reliable correlation between the clinical symptoms and the degree of inflammatory change in the ballbladder because he claims that if impending gangrene and perforation are present one can always feel a palpable gallbladder. Hallendorf,[5] however, disagreed with Saint's rule and found that in 100 cases, in only 39 per cent was a palpable mass felt on physical examination. He felt, therefore, that Saint's rule of waiting for a palpable mass would seem to be misleading in many cases.

McNealy[6] reported 500 cases of acute gallbladder disease seen at the Cook County Hospital. The white blood count was over 10,000, fairly consistently with perforation, gangrene, or empyema, but he states that one cannot rely on it. In 99.6 per cent, pain was present. This was the most reliable sign. In only 29 per cent of his cases was a palpable mass present. Wallace and Allen[7] reported on 2,273 operations for gallbladder disease during a 10 year period at the Massachusetts General Hospital. Of these 415 or 18.2 per cent had acute gallbladder disease with a 6 per cent mortality. This corresponded with a mortality rate of 1.74 per cent in the chronic cases. They stated that age, temperature, and white blood count are unreliable guides for estimating the stage of the disease process. In the cases reported, they pursued a policy of watchful waiting and operated only if

failure of steady improvement was present. Of the patients that perforated, 30 probably perforated while under observation in the hospital! Therefore, since no reliable criteria to indicate the presence of gangrene or perforation can be found, they advised a change in their policy of watchful waiting to one of operating as soon as optimum conditions of the patient and operating facilities are established. They found gangrene was present very rarely before the sixth day of the illness. Therefore early intervention would practically eliminate the hazard of gangrene and perforation.

Marshall [8] stated that attempts have been made to classify patients with acute cholecystitis from a clinical standpoint into various groups and to give fixed rules concerning when operation should be done. The results in groups of cases are cited to indicate the effectiveness of such effort to classify cholecystitis from the standpoint of acute inflammation, age of the patient, rapidity of progression of symptoms, and presence of complications. Although commendable it has caused great confusion. Abdominal signs and laboratory findings do not always give reliable indices as to the severity of the inflammatory process in the gallbladder and watchful waiting may lead to serious complications. It is therefore the custom at the Lahey Clinic, says Marshall, "to regard every case of acute cholecystitis as an emergency and to operate as early as possible." He also feels that acute cholecystitis commonly represents an acute inflammation superimposed on an old chronic cholecystitis associated with stones, a process which in many cases should lead to the diagnosis and treatment before the occurrence of the acute inflammation.

Cowley and Harkins [9] in 25 cases of perforated gallbladder, found the white blood count in 24 per cent to be below 10,000. Tenderness was present in 100 per cent of cases and a mass was present in only 24 per cent. Glen and Moore [10] have reported a wide experience with acute cholecystitis at the New York Hospital since the policy of early surgical intervention was instituted there in 1932 by Heuer. They stated "In our total experience with acute cholecystitis we have concluded that we are unable to distinguish acute cholecystitis with gangrene from perforation with walled-off abscess." Free perforation of a gangrenous gallbladder into the peritoneal cavity is rarely recognized early enough to save the patient's life. Because perforated ulcer, acute appendicitis, acute pancreatitis, and acute gallbladder disease may lead to death if surgical intervention is withheld, a differential diagnosis appears less important than an attitude that leads to early surgical treatment.

The evidence appears to favor the view that given a case of acute cholecystic disease, one cannot know whether it will go on to spontaneous resolution or whether the complications of gangrene, pericholecystic abscess and possibly free perforation may supervene. How often do these complications occur? They occur fairly frequently as attested by numerous reports in the literature, apparently falling between 10 and 46 per cent of all acute cases. Edwards [2] stated that the gallbladder will perforate in approximately 10 per cent of cases. Hallendorf [5] found evidence of pericholecystic abscess in 24 per cent of 100 cases of gangrenous cholecystitis seen at the Mayo Clinic. Kunath [11] stated that 22 per cent of acute gallbladders would perforate if left untreated surgically. Rubenstein [12] reported several cases of acute typhoid cholecystitis in which the incidence of perforation was as high as 45 per cent. Johnston and Otsendorph [13] attempted to determine the true incidence of perforation of the gallbladder in 12,000 autopsies at the Los Angeles County Hospital. In these 12,000 autopsies, 32 people died of perforated gallbladder disease, an incidence of 0.26 per cent. In other words, of all causes of death, 1 person in 375 succumbed to perforated gallbladder. Surely this is a higher incidence than heretofore believed. In 50 per cent of the perforated cases, no diagnosis had been made before coming to autopsy. Johnston and Ostendorph believe that physicians should accept early operation as the logical means of limiting the morbidity and mortality of acute cholecystitis. Heretofore, physicians have not realized the incidence and the gravity of perforations. Cowley and Harkins [9] found that perforation occurred in 2.8 per cent of 12,915 collected cases of operations on all types of gallbladder disease and that perforation occurred in 13 per cent in 2,261 cases of acute gallbladder conditions in which the mortality rate was 20 per cent. Heuer [14] in 1937 concluded that gangrene and perforation of the gallbladder occurred in 20 per cent of acute cases treated conservatively in which the mortality rate averaged 45 per cent. Heuer also found that perforation in acute appendicitis occurred in 17.5 per cent in a series of 593 cases and that perforation of the gallbladder in a series of acute gallbladder conditions observed during that same period occurred in 15.7 per cent. This should dispel any contention that perforation of the gallbladder is rare. Thus it occurs about as often as perforation of the appendix. Frank Glenn [10] felt that the mechanism of perforation may be accounted for by the fact that Rokitansky-Aschoff sinuses were found in one-third of all the gallbladders that had perforated. These sinuses associated with infection and calculi account for the mechanism of perforation in many cases. They also account for the occasional case seen where more than one perforation was present. They state that one cannot differentiate preoperatively between the acutely inflamed empyema and gangrene.

Most all agree that in a patient over 50, the mortality rate in acute cholecystic disease rises sharply. Thus Glenn [15] reports 93 patients over 50 years of age with acute gallbladder disease. In all of these it represented a process of long standing. Many had co-existing disorders of age such as diabetes, high blood-pressure, arteriosclerosis, which often complicated the problem considerably. Sixty-nine of these were treated with cholecystectomy. The others were treated by cholecystostomy. The over-all mortality rate was 6.4 per cent. Heuer, Hallendorf, and McGuigan also stressed the increased mortality rate in the older age groups. McLannahan [16] found that the mortality rate was eight times greater in patients over 60 years of age.

On examination of the reported mortality figures, one finds wide variation due to many factors. Seldom are any two cases alike as we all know. Some surgeons favor immediate operation after a brief period of preparation and others favor delay. Some attempt to find rules to fit every case and others attempt greater individualization. Cholecystectomy is recommended by many when "feasible." Cholecystostomy is employed more often by others. Partial cholecystectomy as described by Ritchie[17] is popular with a few authors. In this procedure the gallbladder is split down to the cystic duct. The contents are removed. The free portions of the gallbladder wall are cut away leaving only the portion attached to the liver. In acute cholecystitis, the mucosa in this segment can be disregarded as it is usually necrotic and will slough. We have had no experience with this procedure, but it appears to have considerable merit in difficult cases. The reported results make it appear to be a better operation than cholecystostomy (Morse and Barb[18]). Common duct stones are found in approximately the same ratio as in chronic cases and most authors recommend common duct exploration if indicated. Jaundice may occur in acute cholecystitis in the absence of common duct stones so that the decision as whether or not to explore the common duct may be a difficult one. It was formerly thought that the very factor which usually produced the acute gallbladder attack; namely, impaction of a stone in the cystic duct, often precluded the possibility of common duct stones. This, evidently, is disproved by reported figures.

The mortality rates reported following the early surgical treatment of acute gallbladder disease while almost uniformly slightly higher than the mortality rates reported following operations for chronic gallbladder disease, offer a considerable advantage to the patient were he to be allowed the alternative of facing a 10 to 46 per cent possibility of perforation with its attending 40 to 50 per cent mortality rate. Thus, Adams and Strannahan [19] in reporting 1,104 cases of gallbladder disease of all types treated at the Lahey Clinic found 55 or 5 per cent fell into the category of acute cholecystitis. All of these were treated by early cholecystectomy with two deaths, a mortality rate of 3.6 per cent. The incidence of common duct stones in these 55 cases was about the same as in their chronic cases. Best[1] reported stones were present in the common duct in 20 per cent of his acute cases and while he advocates exploration of the common duct in those cases where it is technically feasible, if too much edema is present in the ductal area, he relies more on his biliary flush to eradicate possible remaining stones. Eliason and Stevens [3] in their 135 reported cases of acute cholecystic disease treated by early operation, found only two deaths, a mortality of 1.5 per cent. They advocate the following plan for acute cases. If the patient is seen early, prepare and operate. This represents in their opinion the ideal type of cholecystectomy for acute cholecystitis when very little edema is present, but if the patient is seen after twenty-four to thirty-six hours, then they give him morphine, glucose, and a period of starvation for the next twelve to eighteen hours. If, after this time, any one of the symptoms of acute cholecystitis fail to subside, they operate. In their cases, cholecystostomy was performed in 68 per cent with a mortality of 2.1 per cent. Cholecystectomy was done in the remaining 32 per cent with no deaths. Of all the cholecystostomies done, 21 per cent required secondary operations later, in all of which there was no mortality.

Heuer [20] was one of the first advocates of early surgical intervention, having seen Halstad remove an acute gallbladder in 1910 at which time he was impressed by the remarkably smooth convalescence. He was responsible for initiating a policy of early surgical intervention in cases of acute cholecystitis at the New York Hospital in 1932. Since that time up to and including 1945 they have had 527 cases treated with early surgery with 13 deaths, a mortality of 2.4 per cent. These were reported by Glenn and Heuer.[20] In 87.4 per cent, cholecystectomy was done and in the remainder cholecystostomy. In this latter group there were five deaths. They go on to state, however, that the latter operation may occasionally be a life-saving measure in a very sick patient, although it is not to be preferred if cholecystectomy seems safe. In the presence of gangrene and perforation with general peritonitis, a long procedure should be avoided, but if local abscess is found, they usually do a cholecystectomy. The common duct was explored only in those with very definite indications and was done in 8.9 per cent of cases. Of these, stones were recovered in 61 per cent. They made no distinction between the number of days the disease had been present, but individualized each case. The mortality rate thus reported in their cases was comparable to that of the non-acute type.

Goldman [21] reports on bacteriologic studies in 160 cases of acute gallbladder disease. This study coincides with a current feeling that acute gallbladder disease is first of all a mechanical, circulatory, or chemical one. They found a low incidence of positive cultures found in the first three days of the disease. The highest mortality rate was between the fourth and eighth day when the incidence of positive cultures was the highest. In 53 per cent of these cases there were complications due to secondary bacterial invasion. Therefore, the logical conclusion is that one can avoid these complications by early surgery and the use of antibiotics. Graham [22] stated "The time will come when an educated profession and an educated public will demand a prompt operation in acute gallbladder attacks. Cholecystostomy should seldom if ever be performed." Hallendorf [5] stated that in 100 cases of gangrenous cholecystitis, cholecystectomy was done in all cases although it was difficult in some. Three patients died. The results of the remaining cases were classified as good. Heifetz and Senturia [23] report on acute pneumo-cholecystitis, a condition in which an acute infection is present and characterized by the production of gas within the gallbladder. They collected a total of 8 cases from the literature and reported 2 of their own. Surgery alone, according to these authors, is an effective treatment for this condition.

McGuigan [24] made a comparative study of the mortality rate after immediate and delayed operations in acute gallbladder disease. He feels that if there be evidence of progression of the infection as shown by increased fever, leukocytosis, pulse rate, or increase in size of a tender area with muscle spasm that operation should be performed without delay. He studied 123 cases of acute gallbladder disease seen during the past decade. All of these came to operation, the mortality being 5.6 per cent. The most important signs and symptoms in his cases were pain, tenderness, and rigidity. Thus, one sees the same sequence as in acute appendicitis although in a different location. He believes that cholecystectomy is the procedure of choice after a brief period of preoperative preparation. There were only 2 cases of perforation in this series, but he stated that 10 more may have perforated if surgery had been longer delayed as gangrene was present in those 10.

McLannahan [16] reported 140 cases of acute gallbladder disease seen at the Union Memorial Hospital in Albany, New York. The total mortality rate in his series was 8.6 per cent. Jaundice was seen in 20 per cent in which only 5 had common duct explorations. Cholecystostomy offered a 25 per cent mortality and cholecystectomy a 4.5 per cent mortality, cholecystostomy however being used in those patients who were desperately ill so that it was not fair to compare the mortality rates in the two groups. McNealy [6] reported 500 cases of acute gallbladder disease seen at the Cook County Hospital. In 6.9 per cent, perforation was present. This was attended with a 42 per cent mortality rate. In slightly less than one-half of these cases, namely 216, was operation performed. He concluded that it was best to operate within the twenty-four to forty-eight hour initial period, but only 23 per cent of his cases were seen within that period so that it was hard to lay down any definite rule of conduct so far as either the patient or the doctor was concerned. Many patients had weathered previous attacks of gallbladder colic and each day that went by they seemed to feel that it would be the last and after it was apparent that the attack would not subside, oftentimes four or five days had gone by. Thus, it was impossible in many instances to treat these patients in the so-called early period. The mortality rate rises sharply if operated three days or more after the onset, according to McNealy. He favors a policy of careful evaluation. If the symptoms do not abate promptly, operation is advised. He prefers partial cholecystectomy to cholecystostomy in difficult cases. Myers [25] favors early operation in all cases of acute gallbladder disease while Sanders [26] feels that many acute attacks will subside but still favors early operation. The latter author reviewed 3,000 cases of all types of gallbladder disease. The signs according to him that demand urgent surgery are sustained pain, tender mass, abdominal rigidity, rising leukocyte count, and rising temperature. Smith [27] reported 332 cases of acute gallbladder disease from the Presbyterian Hospital in New York City in which cholecystectomies were done in 223 with a mortality rate of 3.5 per cent. The remaining 103 cases had cholecystostomies with a mortality rate of 11.6 per cent. He points out that these mortality rates are difficult to evaluate because the patients having cholecystostomies were the critically ill ones. Wallace and Allen [7] in reporting their 415 cases of acute gallbladder disease studied at the Massachusetts General Hospital during a ten year period, advised cholecystectomy as the ideal procedure. Zollinger and Cutler [28] feel that no rigid rule can be formulated for the treatment of each case as each case should be treated as an individual surgical problem and should always be treated in a hospital with careful watching. They reported 146 cases of acute cholecystitis with a 2.6 per cent mortality rate. Cholecystectomy was done in 70 with no deaths and in only one-half of these cases was a positive culture found at operation which again emphasizes the fact that mechanical or chemical factors were the initiating causes. Exploration of the common bile duct was done in 5 per cent of those cases and only 15 per cent of which were stones found. Cholecystostomy was done in the remaining 28 cases with a mortality of 10.7 per cent. This was again reserved for the more serious cases so that a comparison of the two mortality rates was difficult to evaluate. In the 4 deaths, all had the disease at least eight days.

Cowley and Harkins [9] feel that cholecystectomy is practically always feasible if the patient is seen within forty-eight hours. They report a mortality rate of 2.9 per cent in 86 cases coming to operation within forty-eight hours. This rate compares favorably with the nonacute type. Morse and Barb [18] found that by dividing the type of acute cholecystitis into four pathologic groups, that is acute, purulent, gangrenous, and perforated, the mortality ascends from 6 per cent in the first to 33 per cent in the perforated group. Thus increasing severity of the disease is accompanied by mathematical progression of the mortality rate. They favor partial cholecystectomy and report 12 cases with no deaths. These cases were drained with a catheter in the cystic duct and a cigarette drain. Root and Priestley [29] reported 127 cases of acute cholecystitis seen at the Mayo Clinic in which there were eight deaths or a mortality rate of 6.2 per cent. They favor prompt operation if seen within seventy-two hours. Evidence of hepatitis and pancreatitis were present in 16 per cent. They feel that the mortality and complications were considerably increased in operations performed for acute cholecystitis as compared with those performed for chronic cholecystitis. On this account, if seen after the initial seventy-two hour period, they advise delay if possible until the acute process subsides. In this series, cholecystectomy was done in 64 per cent, cholecystostomy in 31 per cent, and partial cholecystectomy in 2.3 per cent. MacDonald [30] suggests a two-stage management of the acute cholecystitis patients; namely, a cholecystostomy with a mushroom catheter under local anesthesia which disturbs the patient only slightly, and advises a later curative cholecystectomy when common duct exploration if necessary can be done with greater ease. Twelve cases treated in this manner were reported.

Analysis of Material Used in Present Study

During a seven-year period from January 1, 1942, to January 1, 1949, there were 531 operations done at St. Luke's Hospital for non-malignant disease of the gallbladder. Of these, 48 were classified as acute. This was done by careful analysis of the surgeon's notes and the pathologic reports. In a few cases, the pathologic reports were missing but the surgeon's notes and the clinical record of the patient justified placing those patients in this group. Thus the acute cases constituted 9 per cent of the total group. There were 7 deaths from all causes in the total of 531 operations, a mortality of 1.3 per cent. There were no deaths in the 48 acute cases. Of the 48 acute cases operated, the ages ranged from 19 to 75 years, the average being 52.2 years. Thirteen or 27 per cent were males. The symptoms had been present on admission from seven hours to twelve days, the average being two and one-half days. There seemed to be no correlation between the duration of symptoms and the postoperative morbidity. Sixty-four and four-tenths per cent gave a history of previous attacks. The total white blood count in 20.8 per cent was within normal limits and in all averaged 15,400. However, 92 per cent had an increased polymorphonuclear count which appears to be more important than the total count in this series. The staff forms were not recorded often enough to be of any significance. Hence, Best's [1] rule cannot be applied in this study. It was possibly to do a cholecystectomy in 45 of the 48 cases. Thus, in only 3 or 6.2 per cent were technical difficulties such as to require cholecystostomy. In only 4 cases was the common duct explored and stones were recovered in 2. This would seem to be low in comparison with the experience of others and yet to our knowledge, no case has symptoms of residual common duct stone. By way of comparison in the non-acute cases, the common duct was explored in approximately 30 per cent. In 8 patients or in 16.6 per cent of the acute cases, perforation was present at the time of operation. We could find no significant correlation to perforation in these 8 patients with duration of symptoms. The postoperative period was considered uneventful in 33 or 68 per cent. In the remainder, wound infection occurred in 3 cases (in two of these perforation of the gallbladder had been present at operation). In 2 patients, the wound separated and required secondary closure. Oliguria was recorded in 3 cases, inhibition ileus in 2, cardiac decompensation in 2, thrombophlebitis in 1, and pneumonia in 1. In 2 cases, subhepatic abscesses developed; one required incision and drainage, the other drained spontaneously. In both of these patients oxycel sponges were left in the gallbladder bed to control bleeding. We feel that these oxycel sponges were responsible for the development of the abscesses and in several other cases a persistent low grade fever was thought to be due to the presence of oxycel sponges. We no longer use them. The postoperative hospitalization period averaged twelve and one-half days for the whole group. In the last three years, the average postoperative hospital period has been cut to nine and one-half days, this decrease probably being due in no small degree to the routine use of antibiotics. In this last figure, one case is excluded who remained in the hospital forty-five days because of the development of a duodenal fistula. This is one of the patients cited above with a subhepatic abscess due, we feel, to the oxycel sponges. The fistula closed spontaneously and she has remained well.

It is agreed that when one attempts cholecystectomy on the acutely inflamed gallbladder it is more difficult than on the non-acute type. Subcostal incisions were employed in all with complete division of the right rectus muscle and extension of the incision across the mid line and laterally if necessary to obtain good exposure. The gallbladder was usually completely covered with edematous omentum which was easily separated with gloved finger as a rule. It was almost always necessary to aspirate the gallbladder contents with a trocar, open the fundus widely and remove the stones, being especially careful to remove impacted stones, for the proper exposure of the ducts was then made easier. It was commonly possible to brush the edematous peritoneum-covered fatty tissue away from the ducts with gauze. Sometimes this was made easier with the left forefinger inside the gallbladder. We make it a rule not to divide what may appear to be the cystic duct until the common duct, the cystic duct, and the cystic artery are all clearly identified and separated from surrounding structures. In a few instances, the ductal areas were so difficult of identification that the gallbladder was dissected from the liver before proper dissection in the ductal area could be carried out. All cases were drained with a single penrose drain brought out through a stab wound to the right of the incision. The wounds were closed with interrupted linen sutures.

It was interesting for us to discover that in only 18 of the 48 acute cases was operation carried out in the so-called early period, that is, twenty-four to forty-eight hours after onset of symptoms. In one instance, sixteen days had elapsed since onset but this patient had remained at home for twelve days before seeking relief. Even so, the gallbladder was not perforated, although pathologically acute. On the other hand, 1 patient perforated only forty-eight hours after onset of symptoms. This emphasizes again the remarkable variations present in acute gallbladder disease and that attempts to classify and base treatment on the time factor alone seem without real value. We feel after a study of the subject in the literature and our own small group of cases that we shall continue to advise early operation after the elapse of sufficient time in which to study and prepare the patient carefully.

Summary

1. Acute cholecystic disease if untreated surgically will result in gangrene, abscess or perforation in from 10 to 46 per cent of cases.

2. Perforation may result with a mortality rate as high as 45 per cent.

3. There are no known clinical or laboratory signs that are of any real value in determining when gangrene is present and perforation imminent.

4. Operation should be advised in acute gallbladder disease as soon as the patient can be properly prepared.

5. Forty-eight cases of acute gallbladder disease are reported herein which were treated surgically with no deaths.

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UNIVERSITY OF MINNESOTA CONTINUATION COURSES

The University of Minnesota announces the following courses: On March 28, 29 and 30 a course in Physical Medicine will be presented at the Center for Continuation Study. This course is intended for doctors of medicine who are engaged in general practice. The various forms of physical therapy will be discussed and the indications, contra-indications, dangers and limitations will be emphasized. Special emphasis will be placed upon the role of physical medicine in such conditions as arthritis, fractures, and various psychosomatic disturbances. Faculty for the course will include members of the staff of the University of Minnesota Medical School and the Mayo Foundation.

A course in Pediatrics will be presented April 7, 8 and 9 in the Center for Continuation Study for doctors of medicine who are specializing in Pediatrics. The first day of the course will be devoted to problems of allergy in pediatric practice. Emphasis will be placed upon diagnosis and management of hay fever, asthma, and skin allergy. Immunological concepts will be emphasized. An evaluation of the newer drugs will also be presented. Two days of the course will be devoted to infectious diseases in pediatric practice. Subjects to be presented include common respiratory diseases, toxoplasmosis, histoplasmosis, tuberculosis, and rheumatic fever.

Methemoglobinemia:

*Report of Two Cases and Clinical Review**

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Grand Forks, North Dakota

INTEREST in the subject of methemoglobinemia has been stimulated by recent reports in the literature [1,2,3,4] of poisoning in infants caused by excessive content of nitrate in well water. We wish to report two cases and to give a brief review of the clinical aspects of methemoglobinemia.

Case 1. The patient, a boy aged one month, became cyanotic on the evening of October 2, 1947. The mother thought the infant might have had a slight blue spell two days before. There were no other complaints and the infant had been well until the evening of admission. The birth weight was 2.87 kg. The delivery and neonatal history were uneventful. He was receiving a formula containing 225 cc. of evaporated milk, 375 cc. of boiled water, and 24 grams of carbohydrate (dextri-maltose No. 1). The water was obtained from a well on the farm. The infant had received ten drops of cod liver oil concentrate daily for one week but had refused orange juice.

The infant was brought to the hospital about four hours after onset of symptoms. He was acutely ill. There was a striking brownish grey cyanosis of the skin and mucous membranes. The infant was very dyspneic, and the heart tones were rapid, with suggestion of tic tac rhythm. The peculiar cyanosis was intensified when the baby cried. Oxygen inhalation by mask gave no relief. The rest of the examination was negative.

A chest film was normal. The urine contained one plus albumin but was otherwise negative. The hemoglobin was 97 per cent Sahli. Erythrocytes numbered 4,930,000. Leukocytes were 12,750 with 72 per cent lymphocytes, 16 per cent neutrophiles, 10 per cent mononuclears, and 2 per cent eosinophiles.

Since there was no evidence of cardiac or pulmonary disease, a diagnosis of methemoglobinemia was entertained, and 5 cc. of blood were withdrawn from the femoral vein for inspection. The blood had a definite chocolate color. A solution of 1 per cent aqueous methylene blue was made up and autoclaved. Four hours after admission 0.5 cc. of 1 per cent methylene blue was given intravenously. Fifteen minutes later the color was definitely improved. Within thirty minutes the infant's color was pink and he appeared normal. The infant was discharged from the hospital the next morning apparently none the worse for his experience. Subsequent examinations at the office revealed the infant to be normal and doing well. Samples of water from the well were eventually obtained and were found to contain nitrates in the amount of 107 parts per million.†

Case 2. The patient, a boy aged 2 months, was admitted to the hospital on June 6, 1948. About three hours before admission, while giving the infant his morning bath, the mother noted that he was blue and that he seemed "lifeless." The mother stated the infant was unusually sleepy the day before admission. There had been no other complaints.

The infant's birth weight was 3.4 kg. The immediate birth and newborn periods were uneventful. The mother discontinued the breast feedings at three weeks because she thought the infant was not getting enough milk. She gave him a formula containing 225 cc. of evaporated milk, 375 cc. of boiled water, and 24 grams of carbohydrate (dextri-maltose No. 1).

He was examined at five weeks, at which time he weighed 4.2 kg. The infant was found to be normal. At this time the feeding mixture contained 390 cc. of evaporated milk, 570 cc. of boiled water, and 38 grams of carbohydrate (dextri-maltose No. 1). He received 5 drops of a cod liver oil concentrate daily, but the mother had neglected to give orange juice. The rest of the history was negative.

Examination revealed a dusky slate grey generalized cyanosis of the skin and mucous membranes. The infant was irritable. He was well hydrated and the rest of the examination was negative. The hemoglobin was 80 per cent Sahli. Erythrocytes were 3,650,000. Leukocytes numbered 9,900 with 66 per cent lymphocytes, 29 per cent neutrophiles, monocytes 3 per cent, and eosinophiles 2 per cent. Five cc. of blood withdrawn from the femoral vein revealed a chocolate color. Spectroscopic examination of the blood* revealed absorption bands compatible with the presence of methemoglobin.

About 45 minutes after admission, 100 mgms. of ascorbic acid was given intravenously. There was some perceptible improvement in the color of the trunk and lips within 20 minutes. However, the greyish color of the skin and the cyanosis of the nails persisted. This was especially accentuated when the infant cried. Venous blood was still chocolate colored.

The status remained the same for the next four and one-half hours, after which time ¼ cc. of 1 per cent methylene blue was given intravenously. Within five

*From the Grand Forks Clinic.

†Analyses of water for nitrate were made by Division of Laboratories, North Dakota State Department of Health; Melvin E. Koons, Director.

*Spectroscopic examination performed by Dr. G. A. Abbott, Chemistry Department, University of North Dakota.

minutes the finger nails began to lose their cyanosis, and the baby became pink while crying. Ten minutes after injection of methylene blue the blood withdrawn for inspection was of normal color. Within 20 minutes the color of the infant appeared entirely normal.

The infant was discharged from the hospital the same day. Several days later samples of the well water were analyzed and were found to contain nitrates in amounts of 200 p.p.m.

Discussion

Hemoglobin [5] combines with oxygen by reason of the iron which it contains. This combination is not a stable one. When hemoglobin is exposed to oxygen pressure, oxygen is taken up, but no true oxide is formed. The iron remains in the ferrous state, two atoms of oxygen uniting with one atom of iron. This oxygenated hemoglobin (not oxidized) is defined as oxyhemoglobin.

Methemoglobin is a true oxide, in which an atom of oxygen combines with an atom of iron. This is a stable compound, and the gas can only be removed by chemical reaction. It is normally present in the circulating blood in the amount of about 0.1 gram per 100 cc. (0.6 per cent.) When methemoglobin amounts to 3 grams per 100 cc. of blood it gives rise to a peculiar cyanosis. Grossly the blood has a characteristic chocolate color. The color of the serum is normal, since the pigment is in the red cells. Clinically the cyanosis is described as brownish or slate grey.

Methemoglobin itself is not toxic, but it is incapable of giving up oxygen to the tissues. Symptoms will depend on the extent to which it replaces oxyhemoglobin. Methemoglobin has a specific absorption band which can be identified by spectroscopic examination. It can also be measured quantitatively by manometric methods. It differs from the cyanosis of cardiac or pulmonary disease, which is caused by an excessive amount of reduced hemoglobin in the capillaries.

Methemoglobinemia is divided into two types: (1) congenital idiopathic methemoglobinemia, (2) acquired methemoglobinemia.

Sievers and Ryon [6] reported a case of congenital methemoglobinemia in a 19 year old woman, and have written a good review of the subject. They found 18 cases reported up to 1945. The first case to be confirmed by spectroscopic method was reported by Slosse and Wyhouw [7] of Belgium in 1912. However, most of the cases have been reported since 1930.

It has been suggested that the conversion of methemoglobin to hemoglobin is dependent on the reducing system present within the red cell. Methemoglobin is constantly being produced in the circulating blood. It is postulated that in cases of congenital methemoglobinemia, this reducing system within the red cell which normally keeps the methemoglobin at low concentration, is totally or partially inactive. This defect is apparently congenital, and a few of the cases have been present in siblings.

So far, no definite hereditary pattern has been established. However, Codounis [8] and co-workers in France recently reported 14 cases in four successive generations of one family tree. They state that methemoglobinemia is both congenital and familial, that it is transmitted as a dominant characteristic, is transmitted by both male and female, and has no predilection for either sex. On the basis of this study they suggest that the term hereditary methemoglobinemic cyanosis be applied to the disease, and that it should be considered another hereditary disease of the blood, such as, for example, hemophilia and congenital hemolytic icterus.

It is of interest to note that methemoglobin produced by oxidation *in vitro* will disappear after standing in a test tube at room temperature for 24 hours. It has been demonstrated that the blood of a patient with congenital idiopathic methemoglobinemia will maintain a constant level for days.[9]

In patients with congenital idiopathic methemoglobinemia, dyspnea on exertion and tachycardia are frequent findings. They may complain of nervousness, irritability, and frequent headaches. The skin presents the characteristic brownish grey color, especially about the lips, ears, nose, cheeks, finger nails, and mucous membranes of the mouth. So far, no clubbing of the fingers has been reported.

Acquired methemoglobinemia may follow ingestion, and/or absorption of sulfanilamide, nitrobenzene, analine, nitrites, nitrates, and acetanilid. Promin,[10] the drug used in conjunction with streptomycin for treatment of tuberculosis, is said to produce methemoglobinemia. The nitrates are one of the frequent causes of acquired methemoglobinemia.

There have been a number of cases of methemoglobinemia caused by the ingestion of diarrhea mixtures containing bismuth subnitrate. A case of severe poisoning in a five week old infant was recently reported by Wallace,[11] who also reviewed the literature of bismuth subnitrate poisoning. Adults have developed methemoglobinemia after ingestion of ammonium nitrate over a period of time for the purpose of initiating diuresis.[12] Comley [1] in 1945 demonstrated that infants ingesting well water containing large amounts of nitrate (more than 10 parts per million) developed methemoglobinemia. Since that time there have been additional reports of well water poisoning in infants by reason of excessive nitrate content.[2,3,4]

The actual cause of methemoglobinemia by nitrate ingestion is the nitrite ion. On the basis of bacteriologic studies, it is generally accepted that the nitrates are converted to nitrites by the intestinal flora. Upon absorption from the bowel, the nitrites bring about the pathologic oxidation.

The reported cases of well water poisoning have been in young infants, their ages varying from two to five weeks. Our second case was two months old, and the later onset may be due to the fact that the infant was breast fed the first three weeks. The cases reported by Comley had diarrhea. Whether this predisposed to the poisoning or was a result of other contaminations in the water is not known. In other cases reported there is no

history of intestinal complaint, nor was there such in our two cases. A damaged intestinal mucosa may favor the absorption of nitrite, and methemoglobinemia has been associated with diarrhea in adults.

The first infant reported in this paper had a one year old brother and a four year old sister, neither of which demonstrated any evidence of methemoglobinemia. Fawcett and Miller [2] reported methemoglobinemia in fourteen day old twins; a six month infant living in the same house was free. The older infant had been using a formula containing less water. The greater turnover of water in proportion to body weight has been cited as one of the reasons for the apparent exclusive incidence in newborn or very young infants.

In addition to relatively high fluid intake, Comley [1] feels there are other factors which make the infant more susceptible to nitrate. Among these are the fact that the infant contains much less oxidizable hemoglobin than the adult, that the intestinal flora may contain more nitrite converters, that the infant's intestinal mucosa is more easily damaged, and that the limited excretory power of the young infant's kidney may favor nitrite retention. It is also suggested that the infant's enzymatic reduction and oxydation system may be more firmly bound to the nitrite ion. Darrow [13] believes that the methemoglobinemia found in advanced stages of dehydration in infantile diarrhea may in some degree be due to alterations of the enzyme system brought about by circulatory and electrolytic changes.

Cornblath and Hartmann,[10] on the basis of a recent study, claim that only younger infants develop methemoglobinemia upon ingestion of water containing nitrate because of the low gastric acidity characteristic of the neonatal period. They found that when the pH of the gastric juice is over 4.0, nitrite producing organisms can exist high in the gastro-intestinal tract in sufficient numbers to reduce nitrate to nitrite before the former can be completely absorbed. In a control group of infants whose gastric acidity was increased by lactic acid milk feedings, they were unable to produce methemoglobinemia with mixtures containing high nitrate content.

The diagnosis of methemoglobinemia once considered as a possibility should not be difficult. Clinically the brownish grey cyanosis is characteristic, and once seen is not difficult to recall to mind. Venipuncture will reveal the chocolate color of the blood. Spectroscopic examination will identify the methemoglobin absorption band. The laboratory with proper facilities can measure blood levels by manometric methods.

In idiopathic types there may be a congenital and or a familial history. Although responding to treatment, once therapy is discontinued, the cyanosis in idiopathic cases returns. In acquired types, a history of drug ingestion or chemical contact can usually be confirmed. In rural areas, well water should always be considered a possibility if used in the infant's feeding mixture. A nitrate content much in excess of 10 ppts. per million establishes the cause as well as the source. The prompt response to treatment confirms the diagnosis.

The only other pigment which may impart to the blood a chocolate color is sulfhemoglobin. Most of the drugs which cause methemoglobinemia may also cause sulfhemoglobinemia. However, acetanilid and phenacitin are the most frequent cause of this condition, which is relatively rare. They sensitize hemoglobin so that it combines with hydrogen sulphide which can be absorbed from the intestinal tract. Hydrogen sulphide is said to be absorbed in appreciable amounts from the intestinal tract in extreme cases of "intestinal putrefaction." In sulfhemoglobinemia the cyanosis has a lead blue or mauve lavender tint.[14] The cyanosis from sulfhemoglobinemia remains for several weeks after the offending agent is removed, while methemoglobinemia disappears in several days under similar circumstances. Sulfhemoglobin can be differentiated from methemoglobin by spectroscopic examination. This condition has been called enterogenous cyanosis, and arises when the abnormal pigment amounts to over 3 grams per 100 cc. of blood.

In the acquired type of methemoglobinemia, the treatment will depend on the extent to which, and the rapidity with which anoxia develops. Despite visible cyanosis, if the symptoms are mild, merely the removal of the offending agent will allow the spontaneous reconversion of methemoglobin to oxyhemoglobin within a day or two. However, if the onset is rapid or anoxia is threatening to life, the introduction to methylene blue in proper amount will quickly terminate any danger.

Wendel,[15] in 1939, controlled nitrite induced methemoglobinemia in dogs with methylene blue. Subsequently, Hartmann [16] and his associates successfully used the dye in the prophylaxis and treatment of methemoglobinemia caused by ingestion of sulfanilamide.

Methylene blue introduced in large amounts causes methemoglobinemia. This property has been utilized in the treatment of cyanide poisoning. In small concentrations it apparently serves to initiate a catalytic reaction which reduces methemoglobin to hemoglobin in the erythrocyte.

No toxic effects from small doses of methylene blue have been reported. For intravenous use, the recommended dose is 1 to 2 mgm. per kg. It is quite possible that smaller doses are as effective. In our second case we used 0.5 mgm. per Kg. The drug can be obtained in sterile ampules containing 1 per cent solution for intravenous use. However, a 1 per cent solution can be easily made and autoclaved. This can be kept in the emergency treatment room and autoclaved from time to time. It is not necessary to dilute as has been previously recommended. A fourth or half cc. of a 1 per cent solution given by hypo needle into the vein simplifies the procedure in the treatment of an infant. Subcutaneous administration is to be avoided. Methylene blue can be given orally. It is recommended that the oral dose be ten times the intravenous dose. Vomiting, diarrhea, headache, and tinnitus may occasionally occur with oral administration.[16]

Ascorbic acid is capable of reducing methemoglobin *in vitro* and *in vivo*.[15] It was first used for this purpose

by Lian, Trumusan, and Sassier,[17] in France who demonstrated its effectiveness by injecting 100 mgm. daily in a case of congenital methemoglobinemia. However, ascorbic acid acts rather slowly. Sievers,[6] et al, cite a case of idiopathic methemoglobinemia in which 400 mgm. of ascorbic acid were given daily. By the seventh day the methemoglobin had dropped from 25 per cent to 11 per cent. On the eighth day, 7 cc. of 1 per cent methylene blue was given intravenously and the cyanosis disappeared in 30 minutes. In congenital idiopathic methemoglobinemia, ascorbic acid is the treatment of choice. The effective dose is 100 mgm. four times daily for an adult, and smaller amounts would probably be effective for younger patients. Larger dosage is apparently of no value. The ascorbic acid either serves as a catalyst or activates another reducing system. Ascorbic acid is not recommended for the treatment of acute acquired methemoglobinemia.

The prognosis in acquired methemoglobinemia is good if treatment is instituted before severe anoxia occurs. A rapid onset may cause shock or death similar to that from a rapid exsanguination. Congenital methemoglobinemia cannot be cured at the present time. Continuous treatment with ascorbic acid orally can prevent symptoms and alleviate cyanosis.

Public health considerations are important. Bismuth subnitrate could well be dispensed with in the treatment of diarrhea. Nitrite containers should be labeled and kept away from foodstuffs. Substances containing analine should not be incorporated in clothes or toys. Nitrobenezene contained in shoe and furniture polish has caused poisoning. Physicians practicing in areas where water is obtained from wells should be familiar with this condition. The writer now makes it a practice to inquire about the water supply of newborn infants who obtain their water from wells. If the description and location of the well make it suspect, the mother is advised to send in a sample of the water to be examined for nitrate content. If local facilities for such testing are not available, most state health departments will offer the services of a chemist.

Summary

Two cases of methemoglobinemia in infants caused by ingestion of water containing excessive nitrate and successfully treated with methylene blue intravenously are described. Clinically there are two types of methemoglobinemia: (1) congenital idiopathic methemoglobinemia, (2) acquired methemoglobinemia. There is reason to suspect that the former is both congenital and familial and is caused by an inherited defect in the reduction system of the erythrocyte. At present there is no permanent cure, but symptoms can be alleviated with large doses of ascorbic acid. Acquired methemoglobinemia can be caused by the ingestion or absorption of certain drugs, mainly, sulfanilamide, analine, nitrobenzene, nitrates, nitrite, and Promin. Young infants are especially susceptible to well water containing nitrates in excess of 10 ppts. per million. Recent studies indicate that the low gastric acidity in the neonatal period allows nitrate converting bacteria to flourish high in the gastrointestinal tract and permits conversion of nitrite before absorption of nitrate is effected. Diagnosis is made by the peculiar greyish brown cyanosis, the chocolate color of the blood, spectroscopic examination of the blood for methemoglobin absorption band, and by manometric studies for blood levels. For acute poisoning, the intravenous injection of 1 per cent methylene blue in dosage of 0.5 to 1.0 mgm. per Kg. is treatment of choice.

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Bone Marrow Aspirations*

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THE diagnosis of diseases of the blood and of the blood forming organs is often difficult. This is due to the complex nature of hemopoiesis, the numerous factors influencing blood cell genesis and maturation, the bizarre morphological picture of the cells so often encountered in peripheral blood, and the frequent failure of the peripheral blood picture to reveal the true nature of the disease process present in the body.

Actual examination of the organs concerned in hematopoiesis was formerly limited to palpation of enlarged lymph nodes, liver and spleen. The study of biopsy material removed from the organs has often been helpful, but there remains a large number of cases in which the diagnosis from biopsy material warrants confirmation or in which the morphologic picture is not conclusive. A study of the bone marrow will usually reduce this difficulty to a minimum.

The purpose of this presentation is to review briefly the technic of bone marrow aspiration and the indications for the procedure, and to emphasize its value in the diagnosis of obscure diseases of the blood and blood-forming organs. In addition, a few conditions other than those due to diseases of the blood and blood-forming organs will be discussed in which the study of material aspirated from bone marrow will usually establish the diagnosis or confirm a diagnosis based on clinical findings, radiographic studies, etc.

TECHNIC

There are two methods of studying the bone marrow. In the one a plug of sternal bone and marrow are removed for histologic study. The disadvantages of this method are obvious. It is a surgical procedure and the removed material must be decalcified, embedded in paraffin, cut, and stained. This procedure preserves the relationships of the bone marrow elements, but the cellular detail is impaired.

The other method is that of bone marrow aspiration which we employ in our Clinic. It was first introduced by Arinkin [1] in 1929, and has gradually gained favor as a diagnostic procedure. Its advantages are as follows: (1) It may be performed at the bedside, eliminating the use of the operating room; (2) it is a rapid method requiring a minimum amount of time; (3) repeated aspirations can be done, if the necessity arises, as no scar tissue is left behind; (4) most patients do not object to a second puncture, whereas many object to a second trephining; (5) smears obtained give a very clear, detailed picture of the cellular structure present. Unfortunately, the method is not without its limitations in that a dry tap is occasionally encountered, or if a marked hypoplasia of the bone marrow exists, insufficient material may be obtained to warrant a diagnosis. However, these limitations are seldom encountered.

The method of bone marrow aspiration which we employ was first described by Limarzi [2] in 1939. The patient is placed on his back, the region from the first to the fourth costal interspace in the midline is prepared with iodine and alcohol, and the site of the puncture selected opposite the second interspace in the midline.



Fig. 1. Outline of sternum with site of aspiration indicated by dot.

(Fig. 1). This site is then anesthetized with novocain down to the periosteum. An especially constructed 16 gauge needle is used for the aspirations.* This is of large caliber and of great strength and can stand the pressure applied without breaking. It is advisable to have the needle equipped with a guard or flange so that penetration will not be too deep. Such a guard or flange is also of value in permitting the operator to exert greater pressure, and at the same time exercise greater control over the needle. The needle is inserted at an angle between 45 and 90 degrees (Fig. 2); pressure is applied until the point of the needle enters the marrow cavity. This can usually be determined when there is a "give" to the needle similar to that experienced in a spinal puncture. This sensation may not be present, in which event one must aspirate in order to determine whether or not the marrow cavity has been penetrated. Following penetration of the marrow cavity the stylet is removed and a tight fitting 5 to 10 cc. syringe is applied. Suction is then applied and 1 cc. of bone marrow content is aspirated

*Presented before the North Dakota State Medical Association at Jamestown, North Dakota, May 25, 1948.

*Modification of Klima-Rosegger needle made by V. Mueller & Co., 408 South Honore Street, Chicago, Illinois.



Fig. 2. Needle in place at 45° angle.

(Fig. 3). If the bone marrow has been entered, aspiration will usually cause a severe sharp, momentary pain. Only a small amount (1 cc.) is aspirated for



Fig. 3. 5 cc. syringe inserted and 1 cc. of bone marrow aspirated.

two reasons: (1) to maintain a roughly quantitative standard procedure between patients and with the same patient, if further aspirations are done; (2) to prevent too great a dilution with sinusoidal blood. Some hematologists prefer an aspiration of only 0.1 to 0.2 cc. of marrow, thus keeping sinusoidal dilution to a minimum. However, in this method concentration of the marrow elements is impossible, and less material is available for study. After the material is aspirated it is immediately placed in small, paraffin lined Kahn tubes in which a small amount of powdered heparin as an anticoagulant has been placed. After the material has been thoroughly mixed 1 cc. is pipetted into a Wintrobe hematocrit tube and centrifuged for five minutes at about 2000 R.P.M. Following this procedure the tube will reveal four distinct layers (Fig. 4). The first layer will consist of fat measuring 2 to 4 mm. in depth; the next layer will be clear plasma and will vary from a few millimeters in depth to 50 or 70 mm., depending upon

Fig. 4

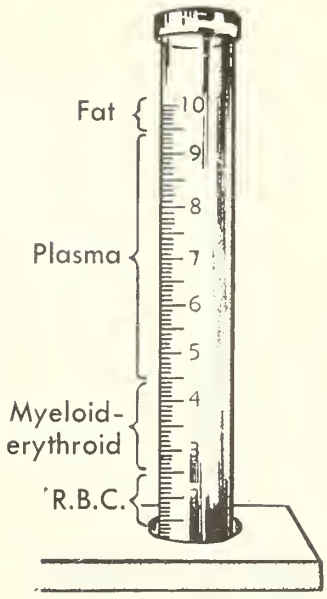
Hematocrit tube after centrifuging for 5 minutes indicates:

(1) layer of bone marrow fat

(2) plasma

(3) myeloid-erythroid elements

(4) red blood cells



the degree of anemia and the amount of marrow present; the third layer is the one in which we are primarily interested, and consists of myeloid-erythroid elements of the marrow plus megakaryocytes and some lymphoid elements; the last layer at the bottom is merely a column of red blood cells. The myeloid-erythroid layer averages 5 to 8 mm. in depth in a normal individual. This can be very low in hypoplastic states, such as aplastic anemia, hypothyroidism or fibrosis of the marrow. In contrast, this layer at times measures 20 to 40 mm. if the marrow is hyperplastic, such as is found in leukemia and pernicious anemia. Thus, we have a rough quantitative estimation of bone marrow activity. Fat and most of the plasma from the Wintrobe tube are removed, leaving a small portion of the plasma to mix with the myeloid-erythroid layer. This material is aspirated from the tube separately and placed on paraffin lined watch glasses and thoroughly mixed. A small amount is then used to prepare blood films in the usual manner on clean microslides. They may then be stained in the usual way by Wright or May-Grunwold-Giesma stains.

Recently the spinus processes of the vertebrae and the iliac crest have been used as the sites of the aspiration. It is likely that these sites would be accompanied by less psychic trauma than using the sternum. Obviously the technic is the same.

Diseases in Which Bone Marrow Is Diagnostic

Diseases in which the bone marrow is diagnostic or of great value in contributing to the diagnosis are as follows:

1. *Pernicious Anemia* (Fig. 5): The patient is frequently cachectic with severe pallor. Malignancy or one of the debilitating diseases is often suspected. Frequently long periods of hospitalization are needed to determine

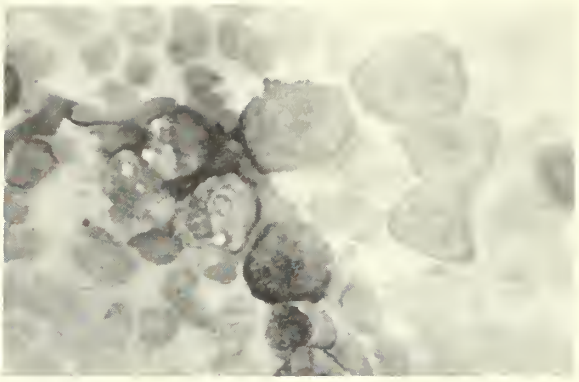


Fig. 5. Megaloblasts in pernicious anemia. Cells characteristically large, deep blue cytoplasm, large nucleus with clumping of chromatin network, and frequently a nucleolus.

the response to liver therapy. Study of the bone marrow reveals numerous megaloblasts. Megaloblastic hyperplasia occurs in cases of primary deficiency such as pernicious anemia, sprue, pernicious anemia of pregnancy, megaloblastic anemia of infancy, and relatively rare cases of nutritional deficiency. When a megaloblastic bone marrow is found the anemia will almost invariably respond to liver or folic acid therapy, thus giving a rational approach to the treatment and often saving considerable time, distress, and expense to the patient.

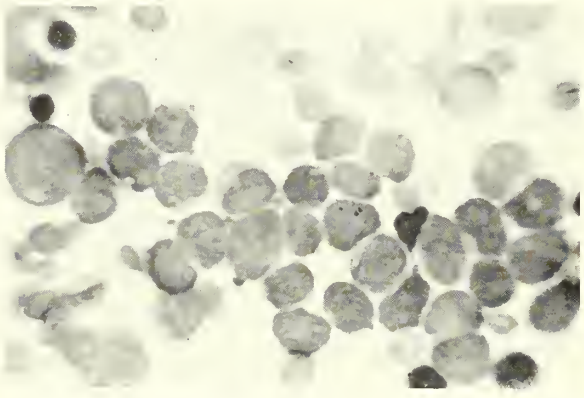


Fig. 6. Acute blast cell leukemia. Bone marrow filled with blast forms characterized by thin rim of cytoplasm and a very fine chromatin network in the nucleus. Nucleoli are also common.

2. *Acute Leukemia* (Fig. 6): In this disease the peripheral leukocyte count is often normal or a leukopenia may be present. The stained blood smear may not reveal sufficient immature cells to establish the diagnosis, or, if only an occasional immature cell is present it may be mistaken for a lymphocyte. The bone marrow in these cases, however, is usually filled with immature cells including blast forms making the diagnosis obvious. This is one condition in which sternal puncture will usually establish the diagnosis promptly and indicate the prognosis, whereas studies of the peripheral blood may not be diagnostic for days or weeks.

3. *Primary Thrombocytopenic Purpura*: This is one disease in which sternal puncture is of great value in determining the indication for splenectomy. It is a disease characterized by bleeding and absence or decrease of platelets in the peripheral blood. Surgical removal of the spleen is curative in most of these cases, but it is necessary that a diagnosis prior to surgery be confirmed without a question of doubt. Sternal marrow aspiration separates this condition from secondary thrombocytopenic purpuras, aplastic anemias, leukemias, infections, metastatic tumors or conditions due to other toxic elements such as X-ray radiation or heavy metals. If the bone marrow contains the normal number, or an increase, of megakaryocytes, then removal of the spleen will stop the bleeding. However, if the megakaryocytes are absent or decreased, splenectomy will not correct the disease. As this is the case in most instances due to secondary thrombocytopenic purpura, differentiation prior to surgery is important to prevent a disaster or failure.

4. *Aplastic Anemia*: If the marrow is hypoplastic, showing a very low myeloid-erythroid layer, the blood smears also show only scattered cells of the myeloid-erythroid series. They are usually the more mature type with very little shift to the left, with an increased number of lymphocytes and with no evidence of regeneration occurring. Megakaryocytes are also absent or decreased. By bone marrow aspiration a differentiation between leukemia, agranulocytosis, and the purpuras can be more easily made.

5. *Agranulocytosis*: In this disease one can often obtain some indication of the ultimate prognosis. If the marrow shows few myeloid cells with no effort at regeneration, the prognosis is decidedly poor. If, on the contrary, the marrow is well stocked with myeloid cells and actual regeneration is occurring, then the agranulocytosis is usually of a temporary character and will respond to large doses of penicillin given to combat the infection and tide the patient over. There are usually two types of marrow in agranulocytosis: (1) The more mature forms of myeloid series are absent, a so-called maturation arrest. The more immature forms are present and often increased. (2) A complete hemopoietic aplasia exists which results in a so-called "empty marrow." This can be confused with aplastic anemia and with myelophthisic anemia.

6. *Primary Splenic Neutropenia and Splenic Panhematocytopenia*: Primary splenic neutropenia and splenic panhematocytopenia, as described by Doan,[3] may present problems in differential diagnosis and therapy. These diseases may be easily confused with other neutropenias and especially with aplastic anemias, aleukemic leukemias, etc. Splenectomy is curative. Before this is done, it is essential that bone marrow studies do not reveal a hypoplastic marrow which is a contra-indication to splenectomy.

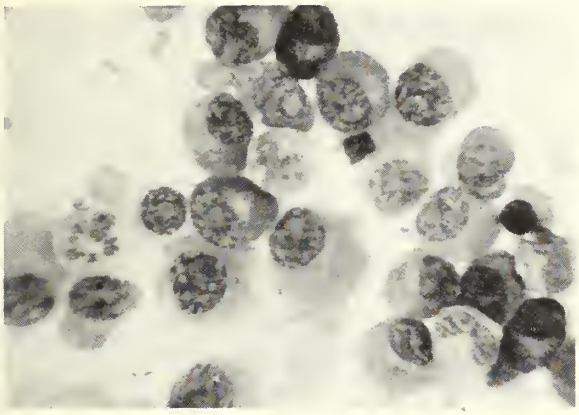


Fig. 7. Multiple myeloma. Numerous plasma cells and plasmablasts characterized by cells with eccentric placed nucleus; frequently with a nucleolus; deep blue cytoplasm often with an irregular border; and with a light zone adjacent to the nucleus.

7. *Multiple Myeloma* (Fig. 7): Bone marrow aspiration is pathognomonic. All other approaches to the diagnosis are indirect. Clinically, there are six cardinal diagnostic signs of this disease [4]:

(1) Multiple involvement of the skeleton in the adult.

(2) Pathological fracture of the ribs.

(3) Bence-Jones bodies in the urine.

(4) Characteristic backache with signs of early paraplegia.

(5) An unexplained anemia.

(6) Chronic nephritis with nitrogen retention, low blood pressure and high serum proteins.

Confusion is common with metastatic lesions, hyperparathyroidism, spondylitis, nephritis, and leukopenic leukemia. Bone marrow aspiration offers a direct approach to the diagnosis by demonstration of typical myeloma cells.

8. *Bone Marrow in Chronic Leukemias*: Bone marrow examination is of little value in chronic leukemia for the purpose of diagnosis. It is of importance only in those cases presenting atypical, clinical, or hematological findings. In lymphocytic leukemia the presence of a large percentage of lymphocytes in the bone marrow is necessary for an arbitrary diagnosis. Many diseases will have a slight elevation of the lymphocyte count which may be misleading. Therefore, a diagnosis of chronic lymphocytic leukemia must be made with considerable caution, if the increase in lymphocytes is only slight, and especially if the marrow is hypoplastic. As in all blood dyscrasias, the presence of immature cells, however few in number, is more helpful than an increased number of the mature forms.

9. *Anemias of Pregnancy*: In anemias of pregnancy bone marrow studies will frequently make a differential diagnosis between the megaloblastic anemia of pregnancy and those due to iron deficiency or to the normal anemia of pregnancy. Peripheral blood changes are often misleading due to a natural hydremia that occurs during this physiological state. The bone marrow in megaloblastic anemia will respond to liver therapy.

The megaloblastic anemia of infancy which has been emphasized recently in the literature can be rapidly and correctly diagnosed by a study of the sternal marrow and proper therapy instituted.

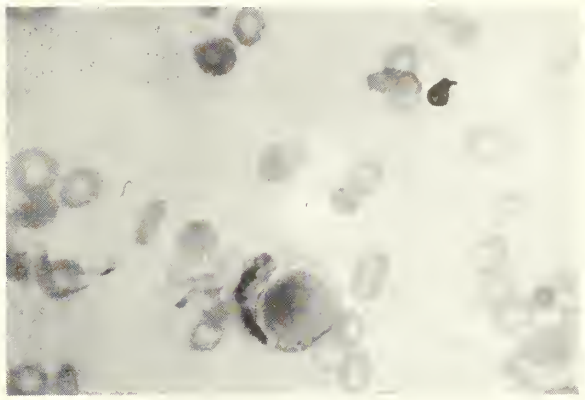


Fig. 8. "L.E." cell in acute disseminated lupus erythematosis. The primary cell is a mature polymorphonuclear leukocyte whose nucleus is pushed to one side by a large amorphous staining mass.

10. *Acute Disseminated Lupus Erythematosis* (Fig. 8): This clinical syndrome is characterized by involvement of the skin, pleural cavities, various organs, and the bone marrow. The symptoms and signs are often bizarre. In the past, diagnosis has usually been made by elimination of all other known clinical syndromes. The disease should be suspected in any patient with a chronic debilitating illness who has fever, leukopenia, signs of an acute or chronic nephritis accompanied by normal blood pressure, ascites or pleural effusion, cardiac murmurs, generalized adenopathy, and joint involvement with or without typical skin manifestations.

Recently, Hargraves and his associates [5] of the Mayo Clinic have described the cells seen in cases of acute disseminated lupus erythematosis and have coined the term "L.E." cell. This finding may prove to be of considerable value in the diagnosis of an often obscure disease. An "L.E." cell is found in mature neutrophilic polymorphonuclear leukocytes and is characterized usually by an amorphous staining mass crowding the nucleus of the cells to the periphery. Although this phenomenon has not been demonstrated in all cases and cannot as yet be said to be pathognomonic of the disease, it does support the diagnosis, when present.

11. Many other diseases of relative rarity can be diagnosed by sternal puncture, such as Kala-Azar and Gaucher's disease, metastatic carcinoma, histoplasmosis, and malaria. Finally, one cannot ignore the negative value of sternal puncture when so much anxiety and apprehension can be relieved and suspected lesions can be ruled out.

Conclusions

1. Bone marrow aspiration is indicated in those cases in which a diagnosis cannot be made, or a prognosis given, by means of the usual history, physical examination, and studies of the peripheral blood.

2. Bone marrow aspiration is simple, harmless, and less painful than a surgical biopsy; if further examinations are needed, repeated punctures may be readily and easily done.

3. Loss of physiological structure and mixture of sinusoidal blood are the disadvantages of sternal aspiration. We believe these disadvantages are outweighed by the concentration of cells and the detail obtained.

4. If proper technic is followed and experienced interpretation available, sternal aspiration will reveal the diagnosis in most instances.

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NORTH DAKOTA STATE MEDICAL ASSOCIATION
1949 ANNUAL MEETING

The Sixty-second Annual Meeting of the North Dakota State Medical Association, together with the Third Annual Meeting of the Woman's Auxiliary, will be held in Minot, North Dakota, May 14, 15, 16 and 17, 1949.

The House of Delegates will meet the evening of Saturday, May 14, and on Sunday, May 15. The Scientific Program will be held on Monday and Tuesday, May 16 and 17, in the Gold Room of the Clarence Parker Hotel, with the exhibits on display in the Saddle Room of the Hotel.

The Northwest District Medical Society is in charge of all local arrangements. Local committees have been appointed and plans are being made for an even larger attendance than in past years. Reservation cards will be forwarded all members of the Association well in advance.

Plans for the Third Annual Meeting of the Woman's Auxiliary are under the supervision of the General Chairman, Mrs. J. L. Devine, Jr., Minot, North Dakota.

Meet Our Contributors

Graham A. Kernwein, M.D., Northwest Clinic, Minot, North Dakota, was graduated from the University of Chicago Medical School, 1930; specializes in Orthopedic Surgery; Chief of Staff, Orthopedic Surgery Section, Northwest Clinic; Postgraduate for six years, University of Chicago Clinics, St. Luke's Hospital, Chicago; Diplomate, American Board of Surgery, American Board of Orthopedic Surgery; Member, Chicago Surgical Society, Central Surgical Association, American Academy of Orthopedic Surgeons, Dakota-Minnesota Orthopedic Society, Northwest Medical Society.

Robert E. Lucy, M.D., DePuy-Sorkness Clinic, Jamestown, North Dakota, was graduated from the University of Arkansas School of Medicine, 1944; specializes in Obstetrics and Gynecology; Staff Member, Trinity and Jamestown hospitals.

Ernest L. Grinnell, M.D., Grand Forks, North Dakota, was graduated from Northwestern University Medical School, 1931; specializes in Dermatology and Allergy; Graduate Study, University of Minnesota, Northwestern University, and Cook County Hospital, Chicago; Chief of Staff, Grand Forks Deaconess Hospital.

V. G. Borland, M.D., Fargo Clinic, Fargo, North Dakota, was graduated from the University of Minnesota Medical School, 1932; specializes in General Surgery; Member, Central Surgical Association; F.A.C.S.; Diplomate, American Board of Surgery.

W. H. Johnston, M.D., St. Luke's Hospital, Fargo, North Dakota; was graduated from the University of Illinois Medical School, 1947; Surgical Resident, St. Luke's Hospital, Fargo.

Louis B. Silverman, M.D., Grand Forks Clinic, Grand Forks, North Dakota, was graduated from Rush Medical School, 1937; specializes in Pediatrics; Pediatric Residency, Children's Hospital, Detroit, Michigan, Beth-El Hospital, Brooklyn; Residency in Communicable Diseases, Kingston Avenue Hospital, Brooklyn; Member, Northwest Pediatric Society.

C. H. Peters, M.D., Bismarck, North Dakota, was graduated from the University of Illinois Medical School, 1938; specializes in Internal Medicine; Diplomate, American Board of Internal Medicine; Associate, American College of Physicians, associated with Quain and Ramstad Clinic.

L. W. Larson, M.D., Bismarck, North Dakota, was graduated from the University of Minnesota Medical School, 1922; specializes in Pathology; Director of Clinical Laboratories, Quain and Ramstad Clinic; Fellow, College of American Pathologists, American Society of Clinical Pathologists; Member, Council of Scientific Assembly, A.M.A.; Chairman, A.M.A. Committee on Liaison with American Red Cross National Blood Bank program; Member of Board of Directors, American Cancer Society.

Report of the Committee on Rural Health

North Dakota State Medical Association

During the past year approximately 42 doctors have come into North Dakota to practice. During the same period of time, approximately 24 have retired. While the shortage of practitioners is slowly being remedied, it is thought that no great increase can be expected as long as the large medical centers, primarily outside of the state, still offer openings for newly trained specialists. The trend toward the desire of becoming a specialist clearly indicates that the location of the rural general practitioner will be among the last to be filled.

There still continues to exist a shortage of nursing personnel even though there has been a considerable increase in the number of nurses this year over last. This year approximately 1000 nurses are registered and living in North Dakota, while last year approximately 800 were available. It is thought that there exists a present shortage of approximately 150 registered nurses. The State Medical Association in 1945 cooperated with the State Board of Nurse Examiners toward the passage of a practical nurses training program. There have been set up, during the past year, three such practical nurses schools and it is thought desirable that these schools should be expanded to at least six in number. It is believed by the Committee that this plan may make available satisfactory bedside nurses thus freeing the registered nurses so that their advance training may be utilized in a more satisfactory manner.

In at least one rural hospital in North Dakota the training of additional registered nurses is being encouraged by a subsidization of the student's tuition. Applications by students are examined so that applicants having good qualifications but lacking in funds for the training program will be accepted.

MEDICAL TRAINING

The 1947 Legislature passed a concurrent resolution which placed on the general ballot an initiated measure providing for a one mill levy for the financing of a University Medical Center. This measure appeared on the general election ballot and was passed by the voters in the state by a wide margin. It will make available an adequate amount of money for the proper administration of the University Medical School. These funds should be expended in the most efficient way possible to the end that the two year medical school be removed from the probation list and established as a sound medical institute. It is hoped that the proper utilization of these funds may result in the education of physicians and, possibly, under the program, graduate nurses who will see fit to practice in the state of North Dakota.

RURAL HEALTH COUNCIL

The House of Delegates at its Annual Meeting has authorized this Committee to proceed with the establishment of Rural Health Councils. The first council under the sponsorship of the Committee on Rural Health of the North Dakota State Medical Association will be established in the community of Elgin, North Dakota, in January 1949. The purpose of the local Health Council will be to exchange information and attempt to adopt programs for the improvement of rural health in its broadest aspects. A wide participation in the membership will be sought and will include professional groups, church groups, lay groups, governmental agencies and farm groups. It is thought that rural doctors particularly must be ever cognizant of the desires and attitudes of the people living within the area in which they practice. It is therefore obvious that the rural practitioner must take an active part in the attendance of all rural health council meetings. As soon as this test council is organized efforts will be made by the Committee to expand the utilization of Rural Health Councils to other parts of the state. It is further felt that these various rural Health Councils, in order to work efficiently, must have close liaison with several organizations on the state level, such as the Governor's State Health Planning Committee. The Governor's State Health Planning Committee, which is an advisory committee to the State Health Council, which in turn is the governing body of the State Health Department, is undertaking a most important work and is ably headed by Chairman E. J. Haselrud, Director of Extension Work at the Agricultural College. Through its deliberations and through the deliberations of the expanded State Health Council more and more organizations are becoming aware of the difficult problems involving the health of the citizens of the State of North Dakota.

HILL-BURTON PROGRAM

While the program for the construction of hospitals under the Hill-Burton Act is showing considerable progress in North Dakota, serious difficulties have nevertheless arisen. The principal cause for alarm is the ever-increasing cost of hospital construction. Many communities making their initial application have found that their original estimates of costs have been entirely too low. This has necessitated additional campaigns for the raising of money which campaigns have encountered more resistance than the original money-raising drives. At least one community in North Dakota has been forced to give up its undertaking. At the present time applications from six communities have received the approval of the state agency and have had allocations of funds made toward construction. Two more communities have been listed as those who will receive allocations as soon as additional money becomes available July 1, 1949. Of the six already approved by the state agency, three have been approved by the Surgeon General. No payment of federal funds has been made as yet. Ap-

proximately eight communities have proceeded with hospital construction plans without the aid of Hill-Burton money; these being largely communities which did not fall within the A priority group. It is hoped that the development of these small rural hospitals will attract young physicians to North Dakota. It is emphasized, however, that these young physicians must be of an extraordinary type. They must be young doctors who are interested in making a success of rural hospitals as well as interested in the practice of medicine. In this connection it is recommended that rural practitioners where new hospitals are developed attempt to obtain endowments for their institutions. Such endowments on a smaller scale are as available in rural communities during these days as they are in the urban centers. Again it should be stressed that rural hospitals should be so spaced and sufficient distance from each other and from the major medical centers so as to insure a large enough trade territory from which they may expect financial support. So far but two hospitals have been completed since the close of the war in rural communities, neither of which participated in federal money under the Hospital Construction Act.

PREPAID MEDICAL CARE

The House of Delegates in May 1948 authorized the expansion of the North Dakota Physicians Service on a statewide basis. Considerable work has been accomplished in the enrolling of physicians in this plan. The expansion will be effected on the basis of the Local District Medical Society, beginning December 1, 1948. In North Dakota this program is affiliated with the Blue Cross and the administration of the program will be effected through their office under the direction of the Board of Directors of the North Dakota Physicians Service. Sales will be made only in those districts where a workable majority of the physicians enroll in the program. Attention has continuously been given to make this prepaid medical care plan of value to the rural practitioner. To this end tonsillectomies, fractures and OB work is now permitted outside the hospital. Further, the Blue Cross will now pay hospitalization benefits to those policyholders having deliveries in licensed nursing homes provided the delivery is attended by a licensed physician. This it is hoped will encourage the holder of North Dakota Physicians Service policies to stay in the rural community and have his services performed by his local practitioner.

1948 GENERAL PRACTITIONER'S AWARD

In an effort to create a greater awareness of the extreme value of the rural practitioner, the State Association authorized the presentation of a General Practitioner's Award. This award has been given this year to Dr. J. G. Vigeland of Brinsmade, North Dakota. Dr. Vigeland has practiced in North Dakota for 36 years and is held in high esteem not only by his fellow practitioners but by the members of the community in which he has practiced. It is thought extremely desirable that the importance of the general practitioner in the rural community be stressed in every way possible, both to encourage young physicians into this field of high service and to aid in the creation of further understanding on the part of the various communities as to problems besetting the rural practitioner.

HEALTH AND EDUCATION PROGRAM

We still report little progress in health education work. Again the need is recognized, but so far funds are not available to carry on this expensive work. Much can be accomplished in the future through the local Health Councils and also through the Health Units of the North Dakota State Health Department.

M. S. JACOBSON, M.D., Chairman,
Committee on Rural Health,
Elgin, North Dakota

MEETING OF THE WOMAN'S AUXILIARY OF THE A.M.A.

Haddon Hall will be the headquarters for the Annual Meeting of the Woman's Auxiliary to the American Medical Association, which will be held in Atlantic City, New Jersey, June 6th to 10th, 1949.

Requests for reservations should be sent at once to Dr. Robert A. Bradley, Chairman, Subcommittee on Hotels, 16 Central Pier, Atlantic City, New Jersey.

AMERICAN COLLEGE OF ALLERGISTS MEETING

April 14, 15, 16 and 17 are the dates for the annual meeting of the American College of Allergists. The meeting is to be held in Chicago at the Palmer House. Anyone interested in attending is requested to make his own reservation with the Reservation Manager, Palmer House, Chicago 90, Illinois.

The JOURNAL LANCET

Official Journal of the American College Health Association, Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, Sioux Valley Medical Association, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology.

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Editorial

THE ERYTHROCYTE SEDIMENTATION RATE

The erythrocyte sedimentation rate is a valuable aid in diagnosis and prognosis over a wide field of clinical problems. Repeated observations of the E.S.R. mirror reliable response to therapy in many inflammatory and malignant states. Despite its recognition by Hewson in 1772, the first practical application of erythrocyte sedimentation was introduced by Fahreus in 1918 as a test for pregnancy. Ensuing years have seen its status in clinical medicine much maligned and provoking as great controversy as any other laboratory procedure. This misjudgment of a proven laboratory aid has been occasioned by the uncritical adoption of technical refinements and faulty performances of same; plus a profound laxity in appreciating the limitations of the E.S.R. as but a laboratory procedure, and as such, being non-specific. The inherent limitations of blood sedimentation must be recognized. Interpretation must necessarily be based on the individual case, and, above all, on a basic understanding of the fundamental principles governing blood sedimentation and of the errors attendant upon its technical performance.

The sedimentation of erythrocytes occurs in three phases, and these phases are conditioned by an abnormality of plasma seen in certain physiological states and disease. The first phase is an aggregation of corpuscles into clumps or rouleaux; the greater the aggregation of the corpuscles, the more rapid the sedimentation. Apparently physico-chemical phenomena controlled by changes in the plasma proteins (fibrinogen and euglobin) lower the stability of a blood suspension in various disease states. There evokes a roughness and granularity of corpuscles which is evident on a blood smear—this making the corpuscles adhere to one another and form clumps of agglutinated cells (auto-agglutination). That the character of plasma and not the cells is the deciding factor is shown by suspending cells of a high sedimentation rate (pregnancy) in plasma of a low rate, in which case a low rate of settling occurs. The second phase of sedimentation is therefore conditioned by the first phase; since the rate of sedimentation depends upon the velocity of rouleaux formation and on the size of the resulting aggregations. The third phase is a progressive slowing as the corpuscles become packed in the bottom of the estimating tube.

Obviously, extrinsic factors disturb this relationship. The variations in technique, though basically alike, must

be judged individually. The differences are in the volume of blood used and the size and shape of the receptacle. In cylindrical or spherical columns, the same blood in varying volumes, heights or diameters will settle differently. Greater volumes sediment more rapidly, and within limits, sedimentation is more rapid in long columns of blood than in short columns. Yet, different volumes of blood reach their point of maximum settling at approximately the same time. Thus, sedimentation may be measured by the fall of blood in a given period of time or by the time required for the blood to settle a given distance. The latter has been proposed as an index of sedimentation; the amount of sedimentation during the first fifteen minutes expressed in the percentage of total fall of the erythrocytes after twenty-four hours. There are various factors which govern the accuracy of the test; namely, constant temperature, avoidance of venous stasis, making the test promptly on collection, using a constant amount of anticoagulant in a perfectly vertical tube.

It follows, then, that intrinsic factors, too, disturb this relationship. Alterations in the number, shape or size of erythrocytes, or more aptly stated, the relative amount of plasma in the blood, is important in determining the sedimentation rate. For this reason, the need to correct for an anemia in a few techniques is obvious; however, several objections have prohibited general acceptance. It is time-consuming for the average worker, and all methods of manipulation of the established alteration of cells to plasma which may interfere with the underlying mechanics of sedimentation. In the case for correction charts, the chart is strictly valid only for the blood sample having the same sedimentation rate and the same initial erythrocyte concentration.

The choice of a method of determining sedimentation of erythrocytes seems dependent upon personal fancy, familiarity and little thought as to which procedure is the more practical for any given situation. The frequent readings of the Cutler and Roarke-Ernastene techniques are too time-consuming for adoption in routine use, and there is little if any practical advantage in their use. Wintrobe's technique permits hematocrit determinations after the sedimentation rate has been determined, which is convenient for correcting an anemia. The Westergren technique has the advantage of reduced susceptibility to the effects of anemia and simplicity of performance. Whichever of the many techniques is used, it seems imperative, because of the number of purely technical factors involved, that a standard technique be rigidly adhered to.

Variations of the sedimentation rate in health must be recognized in interpreting this test. During the last trimester of pregnancy, menstruation and also during excitement in children, the rate is increased.

Realization, then, that variations in health, tissue destruction or infectious processes produce an elevated rate, makes the test non-specific and but a laboratory procedure to be interpreted much as is tachycardia, fever and leukocytosis. Attempts to read much more than this belies clinical acumen, but together with clinical observations and other laboratory aids, its diagnostic and prognostic value is great in inflammatory disease and malignancy.

The E.S.R. is the best available criterion with which to follow the course of acute rheumatic fever and to detect rheumatic activity. The effect of salicylates on the sedimentation rate is in doubt. Coburn has shown that the first administration of large doses of salicylates in the first acute attack of rheumatic fever is followed by a rapid fall in the E.S.R. Butts, however, feels that patients with polycyclic rheumatic fever do not respond clinically nor does the E.S.R. respond to administration of salicylates in a manner comparable to an acute attack. It seems probable that rheumatic activity subsides before the return of the sedimentation rate to normal. In infectious arthritis the sedimentation rate is elevated and the rate parallels the severity of the disease and exacerbations of same as estimated clinically, then recedes as recovery ensues. In hypertrophic arthritis the E.S.R. is normal. In allergic states the rate is little affected. In multiple myeloma the E.S.R. is greatly elevated, probably in direct proportion to the elevation of serum globulin. In severe anemias and leukemias the sedimentation rate is likewise elevated and in sickle cell anemia it is decreased. The value of the E.S.R. in judging prognosis and response to therapy in tuberculosis (pulmonary and extrapulmonary) is time-honored and seemingly with good reason. In latent syphilis, nephritis and especially nephrosis, thyrotoxicosis and severe hepatic disease the rate is also elevated. In virus diseases the sedimentation rate is apparently of little value. A study of the sedimentation rate in infectious hepatitis revealed the sedimentation rate to be but slightly elevated in one-half the cases. The E.S.R. is of definite value in differentiating lower abdominal conditions. It is little affected in early appendicitis, but in acute salpingitis, chronic salpingitis and even Bartholinitis and ectopic pregnancy after ten weeks the rate is increased. The E.S.R. becomes elevated shortly after myocardial infarction and returns to normal over a six to twelve week period. Malignancy or extension of tumor through metastasis is associated with a prolonged sedimentation rate, and, as such, the E.S.R. is playing an increasing role in the differential diagnosis of benign from malignant lesions. Clinically benign growths with an elevated E.S.R. should lead to a search for infection or malignancy. Patients, who have been symptom-free after treatment of malignancy, who subsequently have a rise in the E.S.R., should be suspected of malignant recurrence or metastasis.

This, then, is a plea for greater understanding and patience with a valuable laboratory procedure, which, though non-specific, is informative of inflammatory or malignant disease and tissue disintegration. The type of estimating procedure should be adopted for its simplicity and accuracy, and the technique should be strictly adhered to. It then becomes a valuable adjunct in diagnosis and prognosis.

J. S.

THE $25.00 ASSESSMENT— YOUR CONTRIBUTION TO SOCIETY

The House of Delegates, at the recent Interim Session of the American Medical Association in St. Louis, unanimously voted to assess each member of the Association $25.00. This is the first time in the 101 years of the Association's history that an assessment has been levied. What caused this unprecedented action? What will the money be used for? What are the chances that the objectives will be realized? Every member of the Association should know the answers to these questions.

Since its organization in 1847, the A.M.A. has furthered the objectives as set forth in its constitution: "to promote the science and art of medicine and the betterment of public health." Its policy has been conservative, emphasis being placed on the scientific side of the practice of medicine and the formation of advances in the public health of the nation. The economics of the practice of medicine were largely disregarded until the depression of the thirties when millions of our citizens, and many members of our profession, were in serious financial condition. True, doctors became alarmed over the threat of government medicine after World War I when the Veterans Bureau built hospitals and many veterans obtained free medical and hospital care for non-service connected disabilities, but the program enlarged under pressure of veterans and politicians, and gradually became accepted as a normal function of the government. However, when the New Deal pushed a bill through Congress in 1938 to enlarge the Children's Bureau and to provide Maternal and Child Care to the large segment of the population, the profession really woke up. A special session of the House of Delegates was called, the Children's Bureau Program was denounced, and a set of principles was drawn which is as applicable today as it was then. This action, plus repeated objections raised by prominent members of the profession and by the organized profession in the states, softened the Children's Bureau program somewhat. But war clouds were gathering and we soon became too busy saving our lives to worry much over the Children's Bureau.

In the same year (1938) the A.M.A. was indicted in Federal Court for violation of the Sherman Anti-Trust Law. The case was fought but a verdict of guilty was returned in April 1941. The country was plunged into war eight months later and the profession was hard pressed to supply adequate medical officers and medical care for the civilian population. It was in the midst of this struggle that the Wagner-Murray-Dingell Bill, calling for compulsory health insurance, was introduced in 1943. This was mute evidence that the health of the nation and the future of the profession were in jeopardy. Yet the A.M.A. House of Delegates created the Council on Medical Service and Public Relations with evident reluctance in June 1943 because by doing so the old conservative policy of the Association was being changed to a more progressive policy in which newer techniques were to be employed to meet changing social, economic and political trends. It is unnecessary to review the contributions made by this Council, and those of many members of the Association and State and County Medical Societies in holding the Wagner-Murray-Dingell Bill in committee.

Many members, and a few State Associations, were not satisfied with the Public Relations job being done by the Association. Accordingly the Public Relations function of the Council was removed in 1946 and placed under the direct supervision of the Secretary and General Manager. A staff was acquired, and, with the Republicans in control of Congress and the election of Mr. Dewey a certainty, everything seemed lovely. Disregarded were the warning signs such as the spread of socialism even to England, the threat of a Communist-dominated world, and Mr. Truman stumping the country in behalf of not only the forgotten man but of all men except the few whom he effectively included among the "vested interests." Mr. Truman campaigned vigorously for his health program which includes compulsory health insurance. When the smoke of the last election had cleared the profession awoke to realize the magnitude of the fight it has on its hands. It faced the issue within a month's time, agreed on a statement of policy in which socialized medicine is denounced, *and authorized a program of education of the public which will awaken the people to the danger of a politically controlled, compulsory health insurance system, acquaint the people with the superior advantage of American medicine over government-dominated medical systems of the other countries, and stimulate the growth of voluntary health insurance systems and prepaid medical care plans.*

What will such a program cost? No one knows! There will be no lobbying in Washington. The Washington office will be expanded but will continue as an "information bureau" for interested Congressmen. Emphasis will be placed on informing the public through the press and the radio, who, when informed, will make their wishes known to their Congressmen. Proponents of socialized medicine will have the support of President Truman, the Federal Security Administration and many citizens who either have a lust for power or are blinded by emotion or misinformation. It may well prove the battle of the century for our country because it will determine whether we are to continue our system of free enterprise or are to drift into a completely socialized nation.

Certainly no member of our Association can refrain from this call to duty by paying his assessment promptly, informing himself as to the content of the legislation for socialized medicine, which is already introduced in the Eighty-second Congress, and discussing the issue in an intelligent manner with his patients and friends. The profession has never failed its country in an emergency and it will not fail this time.

L. W. Larson, M.D.,
Bismarck, North Dakota

*Abstract of paper presented before Conference of District Medical Society Officers in Bismarck, January 16, 1949.

THE SOCIAL SECURITY ADMINISTRATION PLANS OUR TOTALITARIAN STATE

In the fight which the medical profession is making against National Compulsory Health Insurance, we need to be very careful lest the unproven remarks of Ewing, et al., regarding the "deplorable" condition of the nation's health as his spurious argument for government control, divert our attention from the main objective of the Social Security Administration. That objective appears to be the creation of a totalitarian state!

If one will agree with the well-established principle that "the power to tax is the power to destroy," he will look twice at the not unlikely chance that the Senate Committee on Labor and Public Welfare will have a new version of S. 1290, which died in committee of the 80th Congress, ready for discussion on the floor of the Senate in the not-too-distant future. Bipartisan support for such a bill is not unlikely, chiefly because, if it follows the pattern of S. 1290, it would follow the now all-too-familiar pattern of "Federal grants-in-aid to the States" with the appealing provision to make more adequate provision for the health of school children. Such provisions, if they run true to previous forms, would provide appropriations for the development of school health services for the prevention, diagnosis and TREATMENT of physical and mental defects and conditions. Of course, the Federal Security Administration would administer the program; no doubt with the Children's Bureau as its willing stooge.

While the foregoing may still be in the field of speculation, it might be well to review what is not a matter of speculation but of record, and see how the Children's Bureau took what was merely a deficiency appropriation in its incipiency, and developed it into the multi-million dollar E.M.I.C. program. Has it ever been known that a governmental bureau ever relinquished, voluntarily, its power?

Now comes Arthur J. Altmeyer, Commissioner for Social Security, speaking on the expansion of the social security program. His remarks were apparently intended for the delegates to the Second National Conference on Unfinished Business in Social Legislation, held on February 7 and 8, 1949. Discussion apparently centered around Federal intervention in the fields of housing, education, social security, civil liberties, and medical care insurance.

This is a formidable list! It seems to leave out nothing but the old-fashioned but still vital american principle of free enterprise. This principle has been in jeopardy ever since 1932 when the "forgotten man" was taught the most pernicious and false doctrine: that "Security" and "Freedom" were synonymous. This country was originally settled, and its independent government set up by people who came here for freedom from *too much* government.

A few illustrations should illustrate how "Security" may be purchased at the expense of "Freedom." Altmeyer, if we are to believe his recommendations, would immediately extend old age and survivors' insurance to 25 million persons not now covered and, as rapidly as possibly, extend National Compulsory Social Security for the entire population. Insurance companies and their millions of policy-holders whose careful and thoughtful savings have built up the creative capital which has so abundantly strengthened America's free and creative enterprise system in good times and bad, in war and in peace, may well ask what security *this* would bring to these United States. Freedom, if it has not yet disappeared, could not survive this blow for it would be taxed out of existence.

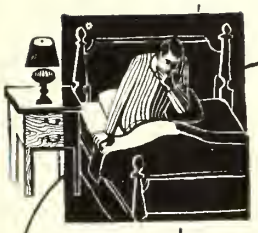
State Legislatures, with their own complex and different problems in the fields of State Unemployment Insurance and Workmen's Compensation Laws, would be asked to transfer these legitimate state functions to the Federal Government. It would make no difference that such problems differ widely in such neighboring States as Minnesota and North Dakota or that widely divergent viewpoints, as well as geography, separate the Legislatures of Maine and California. The universal compulsion that such a program would force upon all of the State Legislatures in dealing with this one phase of the problem would be enough to complete the central control which guarantees the totalitarian State.

Within our own ranks, it might be well to look rather closely at some of the contributions we may, knowingly or unknowingly, make to the creation of the totalitarian state. The American Academy of Pediatrics, recently and properly rebuked for seeking Federal subsidy in the field of pediatric education, may not be the only offender! The Dean of a medical school who, under one guise or another, seeks federal funds to augment his budget, is likely to find that his school is controlled from Washington. Likewise, the hospital administrator who may seek and obtain "free" Federal funds for what may be a worthwhile addition to his hospital will discover that no Federal funds are "free" and that he and his community have lost control of their institution.

College and university presidents and school superintendents, hard-pressed as they are for funds, would do well to think clearly on that problem, sacred to all educators, of "Academic Freedom" before they come to depend too much on Federal Grants-in-Aid to Education. Hitler followed such a course in Germany and it was not only the books but the souls of men that were burned.

The American Medical Association has recently asked its members for a voluntary assessment of $25.00 each for an educational campaign to enlighten the people of the United States against the dangers of a compulsory National Health Insurance Program. This is fine and it deserves our whole-hearted, unanimous support. It may be the means whereby we can point out to the majority, but inarticulate, citizens of our country a far greater danger than the socialization of medical practice: namely, the creation of a totalitarian state. Its major aim should be the repeal, through congressional action, of the Social Security Act which, through the Federal Security Administration that now administers that act, is attempting to create a totalitarian state just as surely as it has been done and is being done by dictator nations throughout the world.

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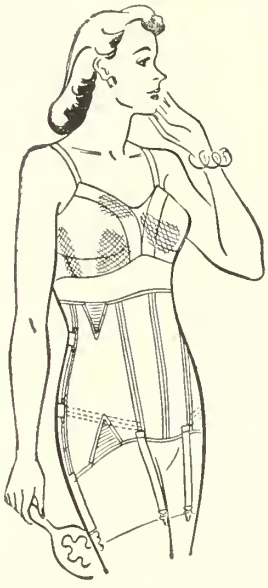
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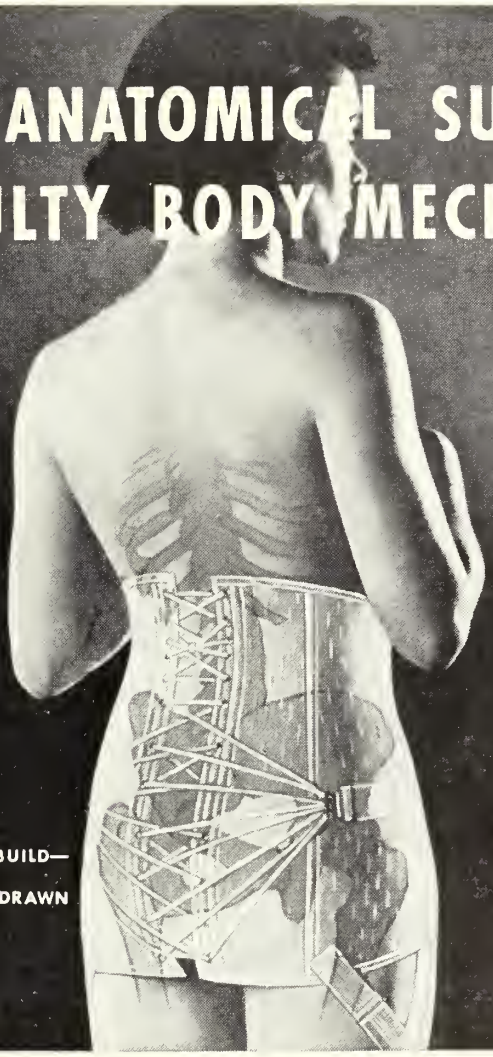
GACKLE, Logan County. Estimated population 850. Estimated drawing territory: 25 mile radius. Distance to nearest hospital 40 miles. Community building modern health center, to be completed about December 1, 1948. 4900 sq. ft. building, brick and tile construction. Includes doctor's office, lobby, dentist office, laboratory, consultation room with dressing rooms; doctor's lab and x-ray; four double bed rooms with baths, delivery-operating room; utility rooms, kitchen and storage rooms, etc. Radiant heat in the floor. Board of trustees plan to permit the doctor to have more or less free rein in this project. Center being built by private individuals, without government assistance. Contact C. C. Lehr, First State Bank, Gackle, North Dakota.

GLEN ULLIN, Morton County. Estimated population 1300. Estimated drawing territory: 30 miles all directions. Distance to nearest hospital 30 miles to Elgin. Office space (very nice) available. Housing can be arranged. Heart Butte dam is under construction by the Bureau of Reclamation 18 miles south of Glen Ullin. Town growing rapidly and can use a progressive doctor. Presently wonderful hunting facilities and with the completion of the dam, the best fishing possible. Further information may be obtained by contacting Jack Curtis, Publisher, The Times, Glen Ullin, North Dakota.

GOODRICH, Sheridan County. Estimated population: 600. Estimated drawing territory: 90 miles south, 30 miles north, 60 miles east, 20 miles west. Distance to nearest hospital: 30 miles. Office space will be made available by Goodrich Commercial Club. Living quarters will be made available. (24 business places in town, six churches, good school, good bank). Need for doctor is great. Contact W. A. Muralt, Goodrich, North Dakota.

HOPE, Steel County. Estimated population 500. Huge drawing territory. Nearest doctor, northwest 18 miles, northeast 30 miles, south, east and west, almost 40 miles. Nearest hospital: Mayville, 30 miles, where they are planning a new improved hospital. Hospital at Sharon also, about 30 miles distant. Cooperstown, about 28 miles distant, is planning a new hospital. Hope Civic Club is gathering money toward a modern office building to be started fall of 48, completed in spring of 49.

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RUTLAND, Sargent County. Estimated population 300. Estimated drawing territory a 25 mile radius. Distance to nearest hospital 32 miles. Community has a large house with surrounding lots, ideal for a hospital of six to eight beds or more, with office downstairs, or ideal for office and doctor's home. If doctor should not wish to purchase it himself, the town is prepared to form an association to remodel, purchase and assist in equipping same for the doctor. Many new commercial buildings being built in town. Has supported a doctor in the past. Nurses available. Further information may be obtained by contacting Mrs. Otto Meyers, Rutland, North Dakota.

STRASBURG, Emmons County. Estimated population 850. Estimated drawing territory: 25 miles west, 6 miles north, 25 miles east and 30 miles south. Towns south of Strasburg have no doctor. Distance to nearest hospital, 78 miles northwest to Bismarck, with very good hard-surfaced all-weather road. Office space available. Living quarters can be arranged. Located in rich grain belt and cattle community with the last nine years very prosperous. Community made up mostly of German-Russians with a Holland settlement south of town. Further information may be obtained by contacting J. M. Klein, Secretary, Strasburg Civic Club, Strasburg, North Dakota.

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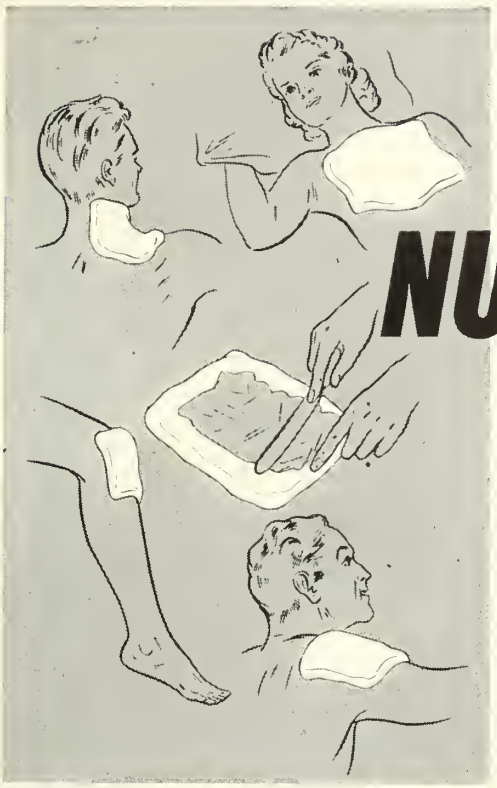
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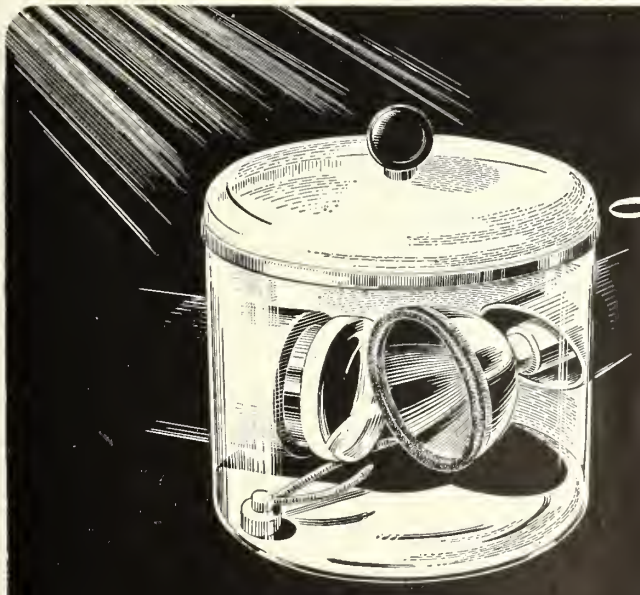
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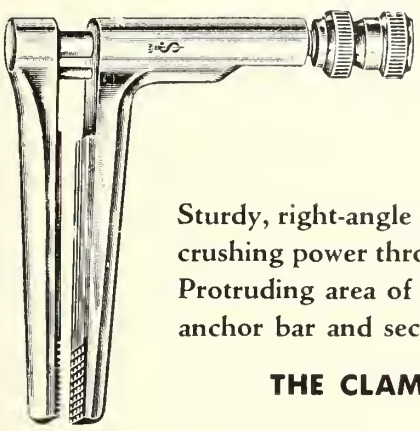
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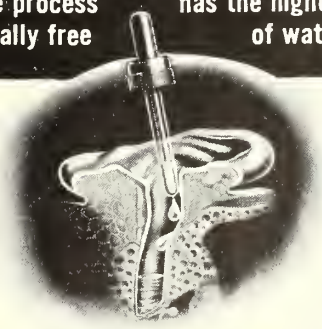
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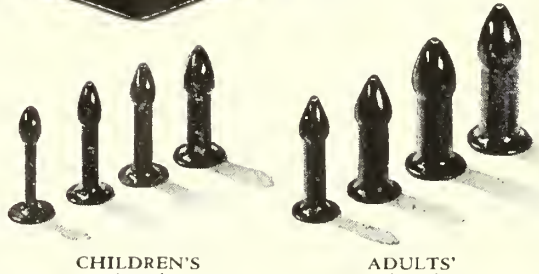
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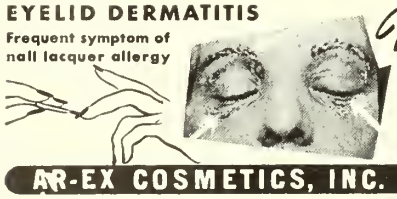
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The JOURNAL LANCET

Vol. LXIX, No. 4
New Series

Minneapolis, Minnesota
April, 1949

Foreword

It is a privilege to have been requested by Dr. J. Arthur Myers to write the introduction to this year's special tuberculosis issue of the JOURNAL-LANCET. Dr. Myers was one of my professors when I attended the University of Minnesota School of Medicine, and was one of the first to enkindle in me an interest in the control of tuberculosis.

I feel further honored when I look over the list of distinguished authors for this issue, most of whom I have come to know personally and who are making outstanding contributions in furthering our knowledge of tuberculosis and its control.

The accelerated reduction in the tuberculosis mortality rate since the last world war is one of the most exciting public health phenomena of recent years. When it is realized that this acceleration has occurred in spite of the fact that insufficient time thus far has elapsed for some of the newer tools in control to have been applied extensively, it is even more encouraging. It causes even the more conservative tuberculosis workers to speak hopefully of the possibility of actual eradication of tuberculosis in the United States within half a century.

This improved outlook concerning the ultimate eradication of tuberculosis is due in no small part to the splendid co-operation of physicians, nurses, other professional workers, and laymen both in governmental and voluntary capacities in the efforts to reach this goal. The variety of fields represented even among the medical profession in this concerted effort is indicated by the various positions held by the authors in this issue, representing as they do sanatorium superintendents, municipal tuberculosis control officers, professors in medical schools, bacteriologists, students' health service physicians, and physicians in private practice.

It gives me a great deal of pleasure to present these papers to you.

JAMES E. PERKINS, M.D.,
Managing Director, National Tuberculosis Association

The General Practitioner's Part in the Eradication of Tuberculosis

S. A. Slater, M.D.*

THE statement has been made many times recently that if we had the money (usually many millions of dollars) tuberculosis could be eradicated in a short time; some placing it as early as in 10 years. Such statements are made by irresponsible persons ignorant of the real problem in handling tuberculosis. It seems to be a recent custom to feel that anything can be accomplished by the expenditure of large sums of money. These inexperienced idealists usually have some special plan they are promoting, saying if the funds were available to carry it out tuberculosis would be wiped out almost over night. Such statements are absurd to one who has been actively interested in the fight to eradicate tuberculosis for more than 35 years. There is no plan regardless of how much is spent that will be suitable for all localities and conditions; none will bring the desired result without the cooperation and wholehearted support of the general practitioner.

Forty years ago some persons thought it would only be necessary to build sanatoria to take care of the known cases of tuberculosis to wipe out the disease. They failed to take into account the big job of finding all cases of tuberculosis and even today with all the effort that has been made many cases reach the far advanced stage or even die before being discovered. Cases discovered early may live many years without recovering or dying. The sanatorium has contributed greatly to the reduction in the death rate from tuberculosis but it did not bring about the eradication of the disease.

Some sanatoria have contributed proportionately more than others. Some have contributed only by caring for the known cases of tuberculosis, others have done much more; they have been actively engaged in the prevention of tuberculosis as well as the treatment. The success of any sanatorium will have to depend in final analysis on the help and cooperation of the general practitioner of the locality which the sanatorium serves.

Recently we have heard and read much about mass surveys and it is emphasized that if everyone were x-rayed all cases of tuberculosis could be discovered. It would be wonderful if everyone could be x-rayed, and if it were done many cases of tuberculosis would be found. There is much more to such a program than just x-raying the individual. If such a program is to be a success much preliminary work must be done before the pictures are taken so that a high percentage of the population responds. Following the taking of the picture, follow-up work has to be done to determine which cases are clinically active. Many x-ray pictures show shadows suggestive of tuberculosis in which no clinical disease is present, on the other hand, many pictures appear negative in which clinical tuberculosis is present. The x-ray survey can be made a valuable aid. There are dangers that must be eliminated if its full value is to be obtained, one of the most common of which is the average layman's belief that if the x-ray shows his chest to be negative it is infallible evidence that he does not have tuberculosis, and the other the confidence of some that they will not have it in the future, both of which are sadly erroneous. *It cannot be too strongly emphasized that while the x-ray is a valuable aid in the diagnosis of tuberculosis, a definite diagnosis should never be made from the x-ray alone, nor is it possible to rule out tuberculosis from the x-ray alone.*

The success of an x-ray survey depends on the follow-up of all suspicious cases. The responsibility rests largely with the General Practitioner.

The tuberculin test while not applicable to all parts of the country is a most valuable aid in eradicating tuberculosis, as has been demonstrated in Southwestern Minnesota in the Riverside and Southwestern Minnesota Sanatorium districts. The results accomplished in these districts would not have been possible had it not been for the whole-hearted support and cooperation of the physicians of those areas.

My experience with the tuberculin test convinces me it will play a most important part in the eradication of tuberculosis. It is true I have been in a locality which lends itself admirably to its use, but little would have been accomplished had it not been for the cooperation of the general practitioner. The tuberculin test is most valuable where the death rate is low and where there are comparatively few reactors. It is effectual after the death rate has been reduced and there are comparatively few cases to be found. The mass x-ray surveys are useful where the death rate is high and the incidence of tuberculin reactors is high. Many demonstrable cases of tuberculosis can be found by the use of the x-ray but the co-operation of the physicians of the locality is necessary to reduce the death rate and incidence of infection to the point where the tuberculin test can be used effectively.

The tuberculin test will have to be used in the final stages in eradicating tuberculosis. It is a most valuable agent when properly used. It is not a big undertaking to test all children of school age. A child who reacts should be considered a potential case of clinical tuberculosis and kept under observation. It is useful further in helping to find the unsuspected source of infection. When a child is found who reacts in a locality such as Southwestern Minnesota and surrounding territory it is not difficult to study the suspected contacts to find the

*Superintendent and Medical Director, Southwestern Minnesota Sanatorium, Worthington, Minnesota.

case spreading infection. There are two adults now undergoing treatment in the Southwestern Minnesota Sanatorium who were found because their children in school were tuberculin reactors. One of them would never have been suspected for he was the picture of health, weighing 200 pounds and feeling well. When his children were found to be infected with tubercle bacilli he was induced to see his family physician whose examination revealed open tuberculosis with involvement of both lungs. He was fortunate in having a physician who did not rely on appearance of patient in making a diagnosis, but who realized that a child who reacts to tuberculin had been in contact with someone who had contagious tuberculosis. This physician also knew that every contact should be suspected until proved free from the disease and that the search should be continued until the source of infection had been discovered. This case demonstrates an important part of the general practitioner's work and the results obtained will depend largely on him.

This emphasizes the fact that the general practitioner is a most important factor in any plan for the eradication of tuberculosis. Any program regardless of how good it may be will fail without his support. He is the very foundation on which any plan will have to depend if it is to be a success, and without his support it is doomed to failure. What can be done to insure his support and interest in this fight to eradicate tuberculosis? Every physician is interested in doing all he can to help eradicate any disease as well as doing everything possible to cure diseases amenable to treatment. It is therefore necessary first to convince him of the importance of what he can do in the control of tuberculosis, second to educate him so he will be in a position to do the most good. His interest will then be enlivened to the point where he will be in a position to render the important service of which he is capable.

Many advances have been made recently in the treatment of tuberculosis. Surgery has played an important part and has taken a high place in treatment. The surgeon is practically helpless without the aid of the general practitioner who is often the first to see the patient, make a diagnosis, and start him in the right direction on the road to recovery. The sanatorium likewise is in the same position, not being able to render maximum results without the co-operation of the general practitioner who finds the case and refers him to the sanatorium where he can get the proper treatment and at the same time protect the public. The tuberculosis specialist is in a similar position for most of his cases are referred to him by the general practitioner who suspects or has made a diagnosis of tuberculosis.

This paper is intended to emphasize the importance of the general practitioner in the campaign to eradicate tuberculosis. No plan can be a success without his assistance and cooperation. He has a significant responsibility and as usual he will arise to the occasion and do his part in seeing that tuberculosis is eradicated. Tuberculosis as a killer has been markedly reduced but the big job is to find the remaining cases which will need unrelinquished effort on the part of all. With everyone working and doing his part tuberculosis can be eradicated.

INAUGURAL MEETING OF THE MINNEAPOLIS SOCIETY OF INTERNAL MEDICINE

The Minneapolis Society of Internal Medicine, a new organization, held its inaugural meeting in the Auditorium of the Hennepin County Medical Society, Wednesday evening, March 9, 1949.

The following officers were elected: President, Reuben A. Johnson; vice president, Reuben Berman; secretary, George N. Aagaard; recorder, Russell M. Wilder; treasurer, Harold E. Miller.

The scientific program consisted of two papers: (1) "Cardiac Catheterization as an Aid in the Diagnosis of Heart Disease," by R. V. Ebert, M.D. (2) "Congenital Isolated Dextrocardia," by Carleton Chapman, M.D., and Thomas Gibbons, M.D.

Active Pulmonary Tuberculosis Following Negative 70 mm. Film Impressions in Minneapolis Mass Chest X-ray Survey

William Roemmich, M.D.*

In a recent editorial[1] there appears this opinion: "It has been emphasized in recent years that *the most* effective method of *controlling tuberculosis* is by means of chest x-ray examinations of the adult population in a *definite period of time.*" Our experience has been too recent to evaluate the survey's *effectiveness in controlling tuberculosis.*[2] This discussion is concerned in trying to determine the *definite period of time* ("time element") required to make surveys most effective as case finding techniques.

The following questions appear related to the "Time Element": How often is pulmonary tuberculosis present though not yet manifest on photofluorographic film? How many have been or will be infected and develop progressive lesions shortly after the report of a negative film? How frequently should or can an x-ray survey be repeated and reveal enough epidemiologically significant new cases? What portion of the new cases discovered after a survey will come from the surveyed and non-surveyed groups of a community?

After the Minneapolis community-wide x-ray survey negative project records were alphabetized. All new cases—regardless of how diagnosed—reported to the Health Department after the survey started, were checked against the negative project records. This procedure revealed the number of people who had negative survey films and later developed tuberculosis. For this discussion, a case of pulmonary tuberculosis is one in which a bacteriological diagnosis has been made.

By December 1, 1948, 23 bacteriologically diagnosed cases of pulmonary tuberculosis were reported from that group of people who had negative films in the survey May 5 to August 25, 1948.

Of the 23 new cases, 15 (65 per cent) were studied because they developed symptoms; three (13 per cent) were studied as contacts; three (13 per cent) had routine x-rays and two (9 per cent) were under the care of a physician for other diseases. Of the 15 who developed symptoms, only three were minimal; nine moderately advanced and one far advanced. Two had pleurisy with effusion. Of 23 cases, 13 (57 per cent) had no contact with known cases; seven (31 per cent) had contact with known cases but were not being followed; three had known contact and were being followed. Contact examinations revealed 13 per cent of new cases. All were contacts of recent open cases. None were contacts of cases revealed by the mass survey. In nine of the 15, symptoms were present at the time the negative film appeared. Of course, there is no way now to relate these symptoms to what later appeared as pulmonary tuberculosis.

Nine were between 15 and 24 years of age; seven between 25 and 34; one was 42; one 47; one 64 and two were 81.

There was no relationship between stage of disease and interval between negative x-ray and subsequent positive x-ray as illustrated in table 1. This information would be even more pertinent if we knew the tuberculin sensitivity as well as x-ray findings. We are certain of only one instance (case 4) in which a person became infected and developed an x-ray lesion after a negative survey film. We have no tuberculin information on the others; and whether the infection took place after the negative film, or whether infection had taken place ten years previously and disease developed now, we shall never know. This information is a minimum essential for planning case finding programs.

TABLE 1

Interval between negative survey film and later positive film	No.	Stage of Disease M.	M.A.	F.A.
Less than 12 weeks	5	1	3	1
More than 12 and less than 24 weeks	6	4	2	0
More than 24 and less than 36 weeks	4	2	2	0
More than 36 and less than 48 weeks	6	1	5	0
More than 48 weeks	2	0	1	1
Total	23	8	13	2

The following case histories illustrate the acuteness with which tuberculosis may progress. The cases are significant only in that previous negative films were available. That tuberculosis may develop acutely is well known.[3,4] These cases also illustrate the fact that symptoms and apparent disease may precede x-ray lesions as much as ten months.

Case 1. (612585). This is a 22-year-old male student who had known exposure in military service two years before present illness began. In January 1947 he developed malaise and began losing weight. During January and February he lost 10 pounds. By October 1947 he had lost 30 pounds. He had an x-ray in the survey on July 2, 1947, which was negative. On October 10, 1947, he had a lesion. We do not know when this patient became a reactor to tuberculin. The evidence indicated that progressive tuberculosis was present ten months or longer before it was revealed by x-ray shadow.

*Surgeon, Division of Tuberculosis, United States Public Health Service. Formerly Tuberculosis Control Officer, Minneapolis Division of Public Health.

Case 2. (22939). This is an 80-year-old man. No known exposure. No tuberculin test. History: Sixteen weeks after the negative survey film, the patient presented himself with swollen draining cervical lymph nodes. Culture confirmed the diagnosis of tuberculosis of cervical lymph nodes. Six months after the negative survey film he developed a small infiltrate in the right first and second anterior interspace. Two cultures of sputum were negative for acid-fast bacilli. He then developed a mass in the right upper lung with rapid progression and death on July 5, 1948, eleven months after his negative survey film. The clinical diagnosis was tuberculous cervical adenitis, minimal pulmonary tuberculosis and bronchogenic carcinoma of the lung. Autopsy revealed normal tracheobronchial lymph nodes. Lung shows caseous necrosis, Langhans cells, tumor in right upper lung field, solid caseous necrosis. Small bronchial nodes and cervical nodes, caseous necrosis and giant cells. Culture, positive for tubercle bacilli. Cause of death, tuberculosis.

Case 3. (101166). This is a 22-year-old stenographer. Her only known contact was a fellow employee with arrested tuberculosis. No history of tuberculin test. Present illness began in late April 1947 with cough, expectoration and malaise. Survey x-ray was taken on May 6th and interpreted negative. Symptoms continued and she consulted a private physician July 7th, when a diagnosis was made of pulmonary tuberculosis, far advanced, active. Bacteriological confirmation followed on August 18th. This case developed from a negative x-ray to a far advanced lesion in less than eight weeks. Pulmonary disease was apparently present but not yet manifest on x-ray.

Case 4. (60409). This is a 16-year-old female followed as a contact of Case 3. On June 2, 1947, survey film was negative. On August 15th a follow-up film was negative and there was no reaction to the Mantoux test with 1 mgm. old tuberculin. On November 16th a moderately advanced lesion was present. Tuberculin test was now positive. Sputum cultures were positive December 11, 1947.

Case 5. (600406). This is a 27-year-old male. History of exposure in Navy. No history of reaction to tuberculin test. This patient had a negative survey film May 6, 1947. At the time he was losing weight, he began coughing, July 3rd, and had lost 10 pounds since the survey film. X-ray film taken in July 1947 was diagnosed pneumonia. Bacteriological diagnosis was established October 5th, tuberculosis moderately advanced. Hospital film was repeated October 12, 1947.

Discussion

It has been demonstrated in animals that lesions may be present grossly before they can be demonstrated radiologically.[5] This is also frequently seen in man when at autopsy there are macroscopic lesions which were not manifest on x-ray. There are two other reasons chest x-ray may fail to reveal the presence of a lesion.[3] Twenty-five per cent of the lung is obstructed by diaphragm, heart, etc., and canont be seen, and lesions are located in other organs of the body.

Nine of our patients who had symptoms at the time the survey film was made apparently illustrate instances of this type. From the standpoint of case finding with the x-ray we need to know how frequently this happens.

A review of the time interval, Table 1, and the cases cited illustrates "fundamental aspects" of pulmonary tuberculosis.[4] The disease develops acutely. Forty-eight per cent of our cases developed within 24 weeks—five to the minimal and six to the advanced stages of the disease. Secondly, stage of disease is not related to time. After 12 weeks, four out of five (80 per cent) were advanced; after 24 weeks, six out of eleven (55 per cent) were advanced. After 48 weeks, 14 out of 21 (66 per cent) were advanced.

It has been suggested that very little, if any, tuberculosis appears in the surveyed group following mass surveys by chest x-ray.[6] We know that every community has a given incidence of new infections with human tubercle bacilli each year. This incidence can be ascertained by tuberculin tests for non-reactors in those areas where bovine infection is minimal. It has been shown that of these new first infections the majority develop progressive manifest lesions within two years or less following infection.[7,8] In our study, new cases of progressive bacteriologically positive disease appeared as 7.7 per 100,000 over a 19-month period. This is truly low incidence and seems to support the suggestion made by others.[6] If this represents the true incidence of disease for the surveyed group over a 19-month period, the outlook for control and eradication appears most hopeful. Can it be that there are many more cases not yet manifest who will appear in succeeding years when the disease becomes more "symptom or x-ray shadow producing"?

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Tuberculosis Control in Colleges*

Max L. Durfee, M.D.†
Oxford, Ohio

For 17 years the Committee on Tuberculosis of the American College Health Association has prepared an annual report entitled, "Tuberculosis Among College Students." The title suggests that the disease tuberculosis, *per se*, is a major problem among the college students of America. Such emphasis is not justified by the facts. However, the *control* of tuberculosis is a problem of world-wide scope which most certainly extends to our college campuses. Review of but a few elementary facts about tubercuolsis clearly indicates the importance of establishing measures directed toward the control of this disease among college students.

Within the past 40 years tuberculosis has dropped from first to seventh in the list of major causes of death in the United States. However, it continues to cause the death of more young women between 15 and 35 years of age than any other single affliction. Men of approximately the same age die more frequently only as a result of accidents.

This communicable disease is caused by a germ. Contrary to a former widely held opinion, tuberculosis is not hereditary. But, owing to the fact that it is spread from the sick to the well by frequent contact between the two, several members of the same family may acquire the disease if one of their number is a victim.

In many respects, life in the college environment is similar to that within the family. One of the main differences is the increase in numbers of persons involved in situations such as the dormitory, the dining hall, or the recreation center. If an active, open case of tuberculosis is permitted to mingle in these groups, tuberculous infection may spread to untold numbers of others. Some of these will acquire the disease and thus a vicious cycle of disease and infection may be established.

The task of preventing such an occurrence would be less difficult if tuberculosis were like other infectious diseases. The obvious offender would be apprehended and isolated until no longer a danger to others. But, among all the germ-caused diseases that may produce disability and result in the death of man, none is the counterpart of tuberculosis. Usually, it is a slow, insidious ailment. It does not ordinarily make its presence known by acute and fulminating illness. In fact, tuberculosis may be present for as long as two years, or more, even in a moderately advanced and communicable form, without causing a sign or symptom to cast suspicion as to its presence. For this reason, it is frequently possible to discover evidence of tuberculosis in apparently healthy people *if special steps are taken to look for the disease.* These "special steps" are the measures employed in a case-finding program for the control of tuberculosis.

Tuberculosis control among the students of a college or university is usually organized as a function of an already existing student health service. Ideally, these programs have two main objectives. One is to determine the incidence of primary tuberculosis among young men and women of college age; the other is to find all cases of active clinical disease, and to get them under adequate treatment, immediately.

At first glance, the two objectives may appear to be the same, especially if considered in the light of our knowledge of other infectious diseases. But, to understand the difference between primary tuberculosis (tuberculous infection) and clinical tuberculous disease is to appreciate one of the most striking peculiarities of tuberculosis. The human body has a remarkable defense against a first invasion by the germ of tuberculosis. If not able to destroy the invaders, it imprisons them, even going so far as to fill the prison walls with a concrete-like deposit of calcium salts. In the process of creating this prison, the body becomes allergic, or sensitized to the protein products of the germ's life processes. Allergy to tuberculo-protein may persist for years, lasting as long as there remains a spark of life in the imprisoned germ. This allergic state may be detected by a simple skin test —the tuberculin test. Therefore, since allergy means presence of the living germ, and since this in turn means infection, we have a method for discovering persons infected with the germ of tuberculosis. Searching for persons with primary tuberculosis (tuberculous infection), is important because if these people subsequently acquire fresh infection, they may develop progressive disease. Or, a breakdown of resistance to the imprisoned germs, allowing them to grow and multiply, may also lead to the active, communicable form of tuberculosis.

The Committee on Tuberculosis has for some time advocated that a certain routine be used for the control of tuberculosis in the college population of the country. Those in authority, perhaps sensing the possibility of criticism because of the controversial nature of the whole question, were wise in adding to the committee of health service workers, an advisory committee of nationally known experts on tuberculosis. In May, 1947, the committee met in New York as a part of the Third National Conference on Health in Colleges. Their purpose was to make recommendations for the best possible methods of tuberculosis control for colleges, these recommendations to be published in the proceedings of the Third National Conference.[1] The recommendations were discussed and drawn up under the watchful and critical eyes of Dr. Charles E. Lyght, then Director of Health

*Presented before the Southwestern section of the American Student Health Association at Dallas, Texas, November 29, 1947.

†Chairman, Committee on Tuberculosis, American College Health Association.

Education for the National Tuberculosis Association; Dr. Esmond R. Long, Director of the Henry Phipps Institute for the Study of Tuberculosis; and Dr. Francis Weaver, Director of the Division of Tuberculosis Control of the United States Public Health Service, they being the only members of the advisory committee able to attend the meetings.

The case-finding procedure that has been recommended by the committee for some years past is as follows:

1. All students new to a given campus are tuberculin tested except those known to be reactors because of having been recently tested elsewhere. For better results, and to insure greater uniformity, tuberculin testing is done intradermally (Mantoux), using Purified Protein Derivative (P.P.D.) in two strengths. The first dose, prepared according to directions, is 0.00002 milligrams. If no reaction occurs after 72 hours a second dose of 0.005 milligrams is given. Equally dependable results may be obtained if a reliable brand of Old Tuberculin (O.T.) is used. The first dose of the latter, injected intradermally, is 0.1 milligrams. When no reaction occurs after 72 hours a second dose of 1.0 milligram is given. Failure to react to the second dose of either P.P.D. or Old Tuberculin may be taken as evidence of freedom from tuberculous infection.

2. Chest x-ray inspection is made on all new students who react to tuberculin, or who are known to be reactors.

3. All non-reacting upperclassmen are retested annually.

4. All reactors are re-x-rayed annually, or more often.

As a result of the New York deliberations, only one change was made in these recommendations. Mass x-ray techniques, so widely used in the general population, and in the armed forces almost from the beginning of World War II, brought to light many unsuspected, non-tuberculous chest lesions. Such has been the case in student health service practice, as well, and frequently these signs of non-tuberculous chest pathology have important significance. In addition to this, many physicians have voiced the desirability of having a "base" film on all students to be used for comparison, should the need arise at a later date. It was, therefore, decided that not only should all new students be tuberculin tested, they should also have chest x-ray inspection. The routine now advocated therefore adds this one new item,—namely, all new students are to be both x-rayed and tuberculin tested, and in subsequent years of attendance, all non-reactors are retested and all reactors are re-x-rayed annually, or more often.

This recommended program has both immediate and long range significance. Of immediate importance, determination is made of the number of students needing further study in the search for active cases of pulmonary tuberculosis. By this, we do not wish to detract from the possibility of active tuberculosis being present in some part of the body other than the lungs. There is, however, no convenient method like the x-ray for determining the presence of extrapulmonary tuberculosis. Nor does tuberculosis in other parts of the body have the public health significance that is inherent in pulmonary tuberculosis. Tuberculosis in organs other than the lungs is not readily communicable.

Of further immediate importance, results of the tuberculin test indicate those among the student body who are not yet allergic to tuberculin, and probably, therefore, not infected with the germ of tuberculosis. The test is very sensitive and accurate to the point of near infallibility. It is true that exceptions to this occur. But, if the test is properly applied and correctly interpreted, the chance for error is one of the rarest in medical diagnosis.

The result of a tuberculin test is of long-range importance to both the reactor and the non-reactor. When a non-reactor is found to have changed to a state of reaction, this evidence of newly acquired sensitivity is said to be very significant. One authority designates these people as "converters" and believes they need careful and frequent examination and x-ray, perhaps every three to six months, for the first year or two following discovery of their infection.[2]

For the reactor, his smoldering infection may flare into activity at any time. Reactors are the potential future cases of tuberculosis. They are the ones who must order their lives to conform as nearly as possible to the accepted standards of healthful living.

Many colleges may find it difficult or impractical to incorporate the approved method of case finding into the structure of their health service program. As a matter of fact, of course, individual schools have found it necessary to build their tuberculosis control program from modest beginnings, even though they constantly point toward the development of an ideal type of program. The section on Tuberculosis in the report from the Third National Conference on Health in Colleges contains some modifications of the optimum program. Variations have also been presented in some detail in previous annual reports of the committee. Largely they are variations in frequency of testing and size of test doses, the latter usually being a single, intermediate dose of P.P.D. (0.0002 mgm. or 0.0001 mgm.), or O.T. (0.5 mgm.).

One type of modified program which has come into wide use in recent years has certain limitations which should be recognized if the decision is made to use it as the case-finding method of choice. A discussion of tuberculosis control in Amercian colleges and universities would be incomplete unless the fact were included that an increasing number are using the x-ray alone as their initial screening method. Many cases of tuberculosis are brought to light when the x-ray alone is used as the initial screen. However, the considered opinion of the Tuberculosis Committee is that tuberculosis can not be controlled with the ultimate goal eradication if only cases are searched for which have advanced to the stage where they cast a shadow on x-ray.

In the absence of definite evidence of disease, the x-ray can not tell us, with any degree of assurance, whether tuberculous infection is present or not. Abnormal x-ray findings which in the past have been thought to be due

to tuberculosis, are now known to be due to a variety of causes, non-tuberculous as well as tuberculous. Among the non-tuberculous calcified "scars" often reported seen on chest films are those which, in recent years, have been considered to be due to certain fungus infections such as histoplasmosis and coccidioidomycosis.

Attention is also called to the considerable numbers with obvious x-ray evidence of lung pathology, even appearing "typically" like tuberculosis, but which are not tuberculous. Regardless of whether x-ray is used as the initial or secondary screen in a tuberculosis case-finding program, the diagnosis of tuberculosis can not be made from the x-ray alone. No one should ever be saddled with a diagnosis of tuberculosis on less evidence than would be the result of careful clinical study. This includes history and physical examination, tuberculin testing, serial x-ray inspections of the chest, sputum examination, gastric washings examination, animal innoculation and culture, and these in combinations appropriate to the case at hand.

Thus, one of the main requirements of a screening method in a tuberculosis control program is that individuals be discovered who are in need of further study. The x-ray is an invaluable tool in this respect especially when it is used as a means instead of an end.

An increasing number of colleges are developing tuberculosis control programs through the use of photofluorographic equipment furnished to them by one of the official health departments or a non-official health agency. Others have installed their own miniature film equipment. It seems to make little difference what size film is used in chest x-ray surveys. The important thing is that various size films be interperted by someone experienced in the reading of that size film. This holds true whether the film is 35 mm., 70 mm., 4x5 inches, 14x17 inches, either celluloid or paper, or any other.

A few colleges have reported using the fluoroscope as their case-finding method. While perhaps better than no x-ray the fluoroscope leaves no permanent record for future comparison should the need arise. Furthermore, it is believed by some that early, soft lesions, the very ones to be looked for, may be missed on fluoroscopic examination of the chest.

Non-student Participation

Every effort may be put forth to protect students from each other but a program for tuberculosis control runs the risk of failure if protection is not afforded against other sources of infection in the campus community. Among these other sources of infection must be included everyone, from the college president to the equipment room manager. No one on the instructional staff should escape, nor should those responsible for the maintenance of student rooms. Food handlers especially should be examined. It is perhaps unwise to point to any one group as being more in need of survey than another, tuberculosis being the ubiquitous disease that it is. As in the student body, if everyone is not included the very one we seek may be missed, thereby defeating our purpose.

Rehabilitation

The ultimate goal of a case-finding program is the return of the unfortunate victim of tuberculosis to a useful place in society. This suggests an important justification of all the time and effort spent on the program. Many cases found on the routine survey of apparently healthy people are discovered to have the disease in an early or minimal stage. This means everything to the attainment of that final goal, a world free from tuberculosis. It means a great deal to the individual found to have the disease. For him, it is discovered at a time when chances for early, complete recovery are best. For his associates, the untold number who are to gain or lose, depending on when the disease is discovered, early discovery usually means discovery before the disease has become communicable. Early diagnosis means tuberculosis control, whether on a campus or in any other community.

The majority of students upon whom a diagnosis of tuberculosis is made have been wise in the election of sanatorium care as the best possible source of correct, scientific treatment of their disease. For the school year 1946-47, 230 cases were reported to have entered sanatoria as compared with 61 who were said to be under treatment at home.[3] Following successful arrest of their disease a large number of these former students will expect to return to college to complete their interrupted careers. During the 1946-47 school year, 590 arrested cases of tuberculosis were reported as having returned to college.

These arrested cases require special attention and sympathetic understanding. Most of them are not able to pursue the usual routine of collegiate activities, both academic and extracurricular. A large proportion should occupy private living quarters. And even under the best possible living conditions for their particular needs they must be checked at frequent intervals to make certain of the continued inactivity of their latent disease.

Conclusion

The foregoing discussion of the recommended routine for conducting tuberculosis control programs in American colleges and universities, and the general remarks concerning the implications of these programs, pertains particularly to undergraduate colleges. Additional techniques may be employed under special circumstances such as are found in medical and nursing schools where danger of exposure to tuberculosis is greatly increased. Here it is deemed wise to examine students at more frequent intervals than the yearly surveys advised for undergraduates. Some medical and nursing schools are considering the use of, or are actually using, BCG in an attempt to immunize their frequently exposed students. BCG is not advocated for use in the general student population. There has, as yet, been no definite proof of the superiority of BCG over the tried and proved methods of tuberculosis control, similar to those herein described, and used so successfully in the United States for many years.

Finally, under no other circumstances may education regarding the true nature of tuberculosis have the influence for good that is possible on our college campuses. From many sources we hear the statement that our students of today will be the community leaders and teachers of tomorrow. It is through their potentiality for wise community leadership that programs may be instituted in all parts of the nation, embracing all groups in the population. Colleges and universities, through their student health services and other facilities for health education, are in an unique position to contribute largely to the final elimination of tuberculosis from the list of prominent disablers and killers of mankind.

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. . . BOOK REVIEWS . . .

Treatment in General Practice, by Harry Beckman, M.D., Professor of Pharmacology, Marquette University School of Medicine, Milwaukee. Philadelphia: W. B. Saunders Co., 6th edition, 1948, 1129 pages, $11.50.

Because this book is kept so thoroughly up to date (the last edition was in 1945), and because it covers every logical demand made in a general practice, Beckman's *Treatment* has become a standard reference in modern medical literature.

The new edition (the sixth) seems to be a worthy successor to its predecessors. Thirty-three entirely new discussions have been added and over 1000 additional have been rewritten and revised. Some of the new and revised material includes data on psychogenic rheumatism, Rickettsialpox, 11 new uses in streptomycin administration, the Rh factor, epilepsy and management of penicillin reactions.

The general practitioner unfamiliar with Beckman's book will find it highly valuable as a quick and thorough reference; physicians who have used it in the past (and their number must be enormous) will find the new edition substantiates the publisher's statement that this is a thorough presentation of the world's latest and best treatments. J. N.

War Neuroses, by Roy R. Grinker and John P. Spiegel. Philadelphia: Blakiston Company, 145 pp, 1945, $2.75.

In this book on war neuroses the authors have done an excellent job in analyzing and grouping the various psychiatric syndromes seen during the war and have presented them in a simple understandable form. Throughout this work the authors emphasize, and rightly so, that the war neuroses are not new clinical entities but represent an expression of the individual's personality make-up when exposed to the severe stress of war.

The authors have included in this book a fine discussion of certain general criteria that may be used in establishing a prognosis in these mental disturbances as well as an excellent summary of treatment. Of particular interest in the latter is the description of the recently popularized therapy of narcosynthesis.

This book comprises one of the most concise, clearly written volumes in the field of psychiatry. The material discussed is illustrated by well selected case reports. Although the subject matter is limited to war experiences, still the basic principles of classification, prognosis, treatment, and dynamics can easily be transposed into the milder stresses of civilian life. As such, this book assumes tremendous value as a psychiatric guide and can be most highly recommended not only for the psychiatrist but to the entire medical profession which inevitably must be exposed to similar clinical syndromes in every-day practice. A. B.

Diabetes and Its Treatment, Joseph H. Barach, M.D. New York: Oxford University Press, 326 pp., $10.00, 1949.

The general practitioner seems to be coming into his own in more ways than a simple recognition and high sounding platitudes in the editorials of the medical press. A new book just released, *Diabetes and Its Treatment,* by Joseph H. Barach, M.D., was written especially for the busy general medical man.

By design the book is organized to help the doctor provide the maximum medical care with the greatest economy of his own time. Simplification of dietetic bookkeeping for the patient, and avoidance of diet-value guessing appears to be a keystone in Barach's presentation. Approximately one-third of the book is devoted to a "system of diets" clearly set forth for a wide variety of caloric requirements. Food portions are stated in lay language so that the diabetic patient will have no difficulty in following the prescribed diet. Since each diet is precalculated, selection of the proper diet is all that is needed, after which the details can be turned over to the office nurse.

Sections on clinical and laboratory diagnosis, clinical pathology, complications and treatment are succinctly presented with adequate illustrations, charts and diagrams to provide a workable understanding. It does not have the usual labyrinth of confusing references and footnotes. Nonetheless, each section carries a well documented bibliography for those who wish to delve into original source material.

Diabetes and Its Treatment is recommended to the general medical man for a highly acceptable clinical approach and a time saving understanding of diabetes and its treatment. A. W. H.



Medical Students and Tuberculosis

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THE purpose of this paper is to complement that written by Dr. J. Harold Schultz on "Medical Students and Tuberculosis," (JOURNAL-LANCET, April 1944.) Data for this paper was gathered by sending questionnaires to the 24 members of the class who transferred from this same midwestern, two-year, medical school in 1945. From these 24 students, now located in all parts of the United States, 22 replies were received which form the basis of this report.

In his report, based on the class that transferred in 1940, Dr. Schultz found that one year previously 83.3 per cent were nonreactors to tuberculin, while on graduation in 1940 only 8.3 per cent failed to react. Later fully one-third of the class required treatment for active pulmonary tubercuolsis.

The class that transferred in 1945 followed much the same curricula as classes of previous years. The only known contacts with tubercle bacilli were in the second year when students performed autopsies, many on patients with tuberculous cavities in their lungs. Autopsy technic remained about the same, those few students doing the work wore rubber gloves, masks and gowns over their street clothes, the rest of the students observed. It is said that an effort was made to exclude tuberculous patients from student autopsies, but autopsy findings revealed that exclusion was far from perfect. During the second year, too, students continued to have physical diagnosis classes, the subjects being, for the most part, inmates of the same institution that supplied most of the autopsy material, many of whom had active tuberculosis.

Of the 22 students whose replies comprise this report, two showed a tuberculin reaction on entering medical school, and 20 were negative. Of the 20 students who were negative, 14 or 70 per cent had their first reaction either at this two-year school or at the time of their first tuberculin skin test after they had transferred, which in most cases was at the time of their entrance physical examination. Of these 14, three can definitely state that they changed during their first two years, seven more were found to be reactors at the beginning of their third year, while four more became reactors later. In the case of these latter four students it is not known whether an initial test was recorded, or whether a skin test was not performed until later in their educational program. Thus only six, or 30 per cent of the group of 20 nonreactors on entrance to medical school, still remain so.

It is unfortunate that only one compulsory skin test was made during the first two years of medicine at this school. This was done at the beginning of the pathology course, but even a single check-up later in the course seemed to be studiously avoided. A few students realized the danger and had periodic skin tests done, those who changed had chest x-ray inspection periodically. At the time of this writing one student has undergone a course of bed rest therapy, and a second is in the process of having the nature of his chest lesion determined. The histories of these students in brief are as follows:

The first showed no skin reaction during the first two years but he reacted on the first test after transferring to a third year school. At this time x-ray inspection revealed no evidence of diseases in his chest. A small hemoptysis at the end of the third year prompted further study, and a diagnosis of early, minimal tuberculosis of the left lung was made. Bed rest was instituted immediately, lasting for four months, with curtailed activity for the remainder of the year. He is now continuing his fourth year, and may be classed as an arrested case.

The second student was a nonreactor during the first two years, on transferring no test was done, but photofluoroscopy revealed no evidence of a lesion. In the spring of 1947 he had a brisk hemoptysis, and reacted to tuberculin. A minimal lesion was located and further studies are now in progress to determine the actual status of the disease.

It is gratifying to know that the incidence of active tuberculosis is much lower, and that the incidence of tuberculin conversions has been reduced in this two-year medical school. However, the incidence is still high (70 per cent) and can be interpreted only as meaning that students continue to be exposed to tubercle bacilli. Of the students questioned, well over one-half felt that they acquired infection during the first two years, only two thought it may have occurred later. Most of them felt that their two-year medical school was grossly negligent in not adopting more strenuous measures for the protection of the students.

It is the purpose of this paper to again stress the importance of prevention of tuberculosis, and to urge schools to adopt every practical measure to protect the health of students. The one arrested case cited again stresses the good results that may be obtained through early case-finding and prompt treatment. It is to be hoped that all schools will keep a close check on their students with the tuberculin test and periodic x-ray inspection of the chests of all reactors.

Immunobiologic versus Exposition Prophylaxis of Disease in Medical Students, Particularly Tuberculosis

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Student health services in medical schools throughout the country employ the classical procedures and techniques to prevent transmission of infective agents whenever practical. It is well known that sanitation effectively suppresses, in fact, eliminates, the diseases which are colloquially designated as "avoidable." Protection of water and food supplies thus controls the infection chains in which the parasite must pass from the intestines of one to the intestines of another. These general measures are mostly ineffective in the control of the "civilization diseases," since contagion is eventually a function of crowding and intimate contact of human beings, and thus "unavoidable." Exposure is frequently not preventable, thus protection of the susceptible human being through immunization before infection, has acquired increased importance. Immunization procedures are systematically carried out by the majority of the health services in co-operation with departments of preventive medicine or of bacteriology for the immunobiologic control of such diseases as typhoid, diphtheria and smallpox. Students benefit from this program both in protection and education.

The data leave no doubt that the protection afforded against accidental laboratory infections has been marked, particularly in the laboratories where students work with experimental typhoid carriers in animals. Inoculated students either fail to contract typhoid fever or have mild and not infrequently abortive attacks.

Since 1930 immunization against diphtheria has been practiced by second-year medical students as a part of their exercises in medical bacteriology. The proportion of second-year medical students susceptible to diphtheria was strikingly high from the early and late thirties until recently when from an all high of 65 per cent it had dropped to a low of 35 per cent. This low rate is probably attributable to the preventive measures applied during their childhood. Immunization of susceptible medical students with diphtheria toxoid is regularly practiced, and stimulation or "booster" injections are recommended when the risk of exposure is great. Reviewing the incidence of diphtheria among the medical personnel during the past 30 years, it is gratifying to note that diphtheria is now unknown, while in the period 1910 to 1925 occasional infections which required specific serum therapy of persons allergic to horse serum proved serious problems, giving cause for hours of anxiety while these patients underwent treatment.

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On several occasions emergency smallpox vaccination has had to be instituted because many students have been accidentally exposed to a patient with florid smallpox who floated into the out-patient services. It was always surprising to find that 50 per cent of the medical students and 60 per cent of the dental students had a vaccinoid or accelerated reaction. Moreover, in the early 1920's over 20 per cent of the students who had been vaccinated showed primary vaccinia reactions. With the universal recognition that potent vaccines are important and their use rather generally accepted, primary vaccinia reactions have disappeared in the student group with histories of previous vaccination. Furthermore, observations on medical students emphasize that the immunity conferred by smallpox vaccines is not always of a high order, and moreover it is frequently temporary. Thus, it must be appreciated by the student health services that whenever unexpected exposure threatens the students, re-vaccination with a potent vaccine is essential.

Until 1939 the major health problem of medical students—tuberculosis—failed to receive the attention it deserves. Personal experience had taught that prior to this date it was by no means uncommon that one or two students dropped out of school each year because of tuberculosis. The Student Health Service of the University of California Medical School became greatly concerned when in 1939 in a group of 60 students not less than five became ill with clinically recognizable active, primary pulmonary tuberculosis. This experience had a very bad effect on the morale of the students, and prevention became the subject of consideration and discussion by the faculty. As epidemiologist and adviser in public health matters I was asked to collect information relative to certain preventive measures used in other schools and hospitals.

In a short report in 1940 it was emphasized that the situation at the University of California differed in no way from that in other institutions. The fact that medical students with a negative tuberculin reaction would, after receiving instruction in the tuberculosis wards of the San Francisco Hospital, become tuberculin-positive had been recognized in connection with a program started in 1935 by Charles E. Shepard at the University of California and Stanford University under the auspices of the San Francisco and Alameda Counties and California State Tuberculosis Associations. Examinations made under this program had shown that among a group of 60 medical students the percentage of tuberculin-positive students rose from 78.3 per cent in the sec-

ond year to 97 per cent in the fourth. When the tuberculin-allergic state of the students was below 40 per cent the "conversion" to tuberculin-positive reaction was correspondingly lower, and approximately 60 per cent reacted in the fourth year. These figures corresponded with those reported by Myers and his associates who found that the 37.5 per cent of the students at the University of Minnesota School of Medicine who gave a positive reaction to the tuberculin test on entrance converted to 72 per cent at the end of the fourth year. On the other hand, in the School of Education the incidence of positive reactors increased from 24.8 per cent on entrance to 28.5 per cent on graduation. Ruth E. Boynton, who analyzed the data on tuberculosis among two groups of nurses and one group of university students in Minnesota, estimated that the tuberculosis infection rate for student nurses on a general hospital service was 100 times as great, and for student nurses on a tuberculosis service 500 times as great as for students in the School of Education.

Additional evidence that occupational exposure to tuberculosis increases tuberculosis morbidity among tuberculin-negative students was and has recently again become available in reports from a diversity of sources. Among the medical students in Oslo, that Scheel has observed since 1926, 4.3 per cent tuberculosis morbidity per observation year was found in the tuberculin-negative group, 1.4 per cent in those positive without a history of symptoms, and 2.9 per cent in those who had such a history. Equally important is the statement by Gullbring that the junior members of the Söderby Hospital Staff furnished a subsequent tuberculosis rate several times greater among the originally negative reactors than among the positive reactors. He concluded and recommended that a tuberculin-negative applicant for work with the tuberculous should not be accepted for such service. Ulmar and associates found a 2 per cent tuberculosis morbidity among nurses. Rist, in a study on 1,047 medical students at Paris for a period of four to six years, reported that at the beginning of their clinical studies 11.35 per cent were tuberculin-negative. This figure compares unfavorably with 38.05 per cent, 45.84 per cent and 50.9 per cent found in students of the same age at three different high schools. Of the tuberculin-negative medical students a primary infection accompanied by clinical signs and symptoms developed in 34 per cent. In only 4.37 per cent of the positive reactors did the disease become clinical. It is important to note that in the experience of Rist a qualitative difference between the disease in the two groups was observed. Under the conditions prevailing among the students in Paris, disease in the previously tuberculin-positive group was markedly more severe than the primary infection in the tuberculin-negative group. However, early treatment resulted in arrest of the disease in 90.9 per cent of cases and the patients returned to work. Anyone familiar with the findings reported by Morris will agree that the tuberculin-positive rate of 100 per cent, positive x-ray findings rate of 16.7 per cent and case fatality rate of 10.7 per cent in a group of women medical students attest to an inestimable social and economic loss which must be corrected by the physicians of the student health services.

At the time the available information concerning tuberculosis in hospital personnel, medical students and other members of frequently exposed groups was analyzed, the very important paper by Flahiff furnished provocative observations that among persons admitted to an institution in which tuberculosis was prevalent, the rate of onset and the death rate from the disease were higher in those who did not react to tuberculin on admission than in those who were sensitive to tuberculin when admitted. Ferguson, after study of conditions in Saskatchewan, concluded that the chance of contracting progressive, clinical tubercuolsis when exposed to tuberculous infections is higher in tuberculin-negative than in tuberculin-positive persons. The latest observations by Heimbeck in the Ullevaal nurses indicate that the tuberculosis morbidity among the tuberculin-negative was about nine times greater, and the mortality rate more than ten times greater than among those who were tuberculin-positive.

The well-known report on the Prophit Tuberculosis Survey, which covered nurses, medical students, contacts of tuberculous persons, etc., in the Royal Navy — although presenting evidence (a) on the high incidence (82.8 to 84.5 per cent for medical students) of sensitization and (b) on the liability of students negative to tuberculin—clearly emphasizes that the morbidity rate varies in different hospitals irrespective of the initial tuberculin reaction. In some hospitals the rate is consistently higher than in others. With a 13 per cent positive tuberculin rate on admission and 28 per cent on graduation, Levine found no clinical tuberculosis among 980 nurses at Michael Reese Hospital in Chicago.

On the whole, the evidence suggests that young men and women who enter the career of medicine and who have passed safely through their primary infection are less subject to manifest tuberculosis when exposed to fresh infection than are those with no previous experience with the tubercle bacillus. Furthermore, in the heavily infected milieus of a tuberculosis hospital, the advantage of escaping the professional hazard of tuberculosis is definitely with the allergic.

At the beginning of 1940 it was fully realized that, from the standpoint of preventive medicine and in the interest of the future health of the students entrusted to the care of the University, it was imperative to devise means and to take steps to reduce the risk of incapacitating clinical tuberculosis while attending services and classes offering a special hazard. In consultation, Dean Langley Porter recommended that it might be proper to extend to students who are tuberculin-negative the privilege of refusing to take courses in tuberculosis at the San Francisco Hospital. In the course of a spirited discussion which followed this recommendation, it was pointed out that many other services may play a role and that the average medical man could hardly expect to escape exposure to the tubercle bacillus in the course of his professional duties whether as a student, an intern or later as practicing physician. It likewise appeared in

1940 that the problem of tuberculosis in medical students and graduates will not be solved by denying them the experience on special tuberculosis services or sanatoriums which for reasons too numerous to mention were not in a position to enforce rigid contagious disease technique. The proponents of exposition prophylaxis against infection in tuberculosis wards had only in part appraised the risk of air-borne infection in other localities in the hospital, and they knew relatively little concerning the adequacy of the masks they recommended. Indeed, Pressman (1937) using a simple expedient of exposing four dishes containing saline in the corners of a room for one week was able to demonstrate the presence of tubercle bacilli in 87 per cent of 55 samples taken from four tuberculosis hospitals and sanatoriums. Certain technical procedures involving centrifugation of sputum specimens, the examination and, in particular, the manual palpation of autopsy specimens from tuberculous patients and several others doubtless represented a risk of infection which could only be reduced by the most painstaking supervision. No one will quarrel over the dogma that students should never be permitted to participate in the care of tuberculous patients without the assurance that protective contagious disease techniques are rigidly enforced. Unfortunately, these specifications are not readily met and the risk of exposure continues to exist. The members of the committee fully appreciated the limitation of the exposition prophylaxis and therefore devoted considerable time to an appraisal of the immunobiologic method.

Preventive vaccination with the Bacillus Calmette-Guérin had received considerable attention, particularly in view of the encouraging result which had been reported by Heimbeck with student nurses at Ullevaal Communal Hospital in Oslo; the studies by Scheel and Malmros and Hedvall emphasized striking differences in the disease incidence among tuberculin-negative and tuberculin-positive medical students at the University of Lund in Sweden. Heimbeck had shown that a positive tuberculin reaction can be produced by BCG vaccination, and it was quite a natural step to make an attempt to protect tuberculin-negative medical students and nurses by means of vaccination. These studies conveyed already in 1940 to the immunologist the factual conviction that BCG raises the threshold of infectability in the vaccinated so that nurses, attendants, interns and others exposed to tuberculous infection are better protected than the unvaccinated.

The report on BCG from the United States was limited to the paper by Kereszturi and Park, who produced satisfactory evidence that the BCG vaccine reduces the tuberculosis death rate to one fourth in the children parenterally vaccinated. Although it had been proved through exhaustive legal and scientific investigations that the "Lübeck tragedy" in the summer of 1930 when 73 of 249 perorally vaccinated newly born infants died with generalized tuberculosis of gastro-intestinal origin was caused by a contaminated culture, opposition to BCG took its roots in this event. That the culture of BCG distributed by the Lübeck Laboratory had been contaminated with the Kiel strain of virulent human tubercle bacilli was confessed by the laboratory technician. This explanation was plausible because the culture used for making up the vaccine had been used extensively in France and Rumania and elsewhere without any untoward results that might justify the claim that it had reverted to a virulent state in the human body.

Another report made an impression on the Committee: G. G. Kayne, in his detailed inquiry into the use of BCG in western Europe, said: "Two facts with regard to BCG are, nevertheless, now emerging: *it is harmless, and it is of some value if used, under certain conditions, as an adjunct to other methods of prophylaxis.*" Concerning its use in adults, he made the following statements: "The work of Heimbeck and Scheel among nurses and students has indicated the use of the vaccine in the field. Before any such measure is applied in another country, however, it is essential to know whether the same problem exists in the latter. In England we are hardly in a position to dogmatize as to the tuberculin sensitization of nurses and students beginning hospital work, or as to what may be the subsequent danger they run. Such investigations must, therefore, precede any consideration of the use of vaccination in them." It is further stated that "certain conditions as regards the vaccine and its administration must be fulfilled and the vaccination of tuberculin-negative adults likely to be in much contact with tuberculous patients must be considered."

In order to secure the opinion from those who are fully acquainted with the problem of BCG vaccination in the United States, a series of questions were submitted to Dr. Esmond R. Long, Director of the Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis, University of Pennsylvania. Under date of January 31, 1940, Dr. Long kindly answered the questions and added the significant statement:

"We are thinking of inaugurating a program in nurses. We have so few tuberculin-negatives in the School of Medicine in the University of Pennsylvania that a research program could hardly be organized, and we still feel that a BCG program if attempted *should be set up on a research basis.* We are confident that *no harm whatsoever is caused,* but up to the present we have not instituted any indiscriminate vaccination."

After carefully weighing the evidence available and fully cognizant of the responsibility involved, the Committee (Drs. S. J. Shipman, S. T. Pope, Jr., J. C. Geiger and K. F. Meyer) recommended in March, 1940, to Dr. William G. Donald, University physician, as follows:

(a) That the infirmary physician, assisted by the instructors in tuberculosis, acquaint the medical students in the second-year medical curriculum with the facts relative to the liability of tuberculin-negative reactors to tuberculosis while taking courses in the San Francisco Hospital or subsequently while practicing medicine. This factual information should precede all other actions and should be objective in its presentation.

(b) That the infirmary physician be authorized to offer on a *strictly voluntary basis* the intracutaneous vac-

cination with BCG at least four months before the students enter the tuberculosis wards.

(c) That he institute such methods and procedures of surveillance, examination, etc., as outlined in the letter by Dr. E. R. Long, and that the tuberculin-allergy should be determined before the vaccinated students are admitted to the wards.

(d) That the vaccine be secured by air mail from the Henry Phipps Institute, since it would be impractical to prepare the vaccine under proper supervision on the West Coast and deterioration during 48 to 72 hours is slight.

In the acknowledgment of the recommendation, Dr. William G. Donald added the significant paragraph:

"The danger to the health and life of medical school students is greater, I am entirely convinced, in the tuberculin-negative student who is unvaccinated. There is to me conclusive evidence that some measure of immunity to tuberculosis is obtained by vaccination with BCG. Medical students, after being adequately informed as to all the facts of the vaccination, should be encouraged to avail themselves of this protection on a voluntary basis until such conclusive evidence is gathered which would justify mandatory vaccination."

By the end of 1940, 12 second-year medical students, proved totally unreactive to the stronger dilution of P.P.D. and O.T. (0.1 cc. of 1:100) had received BCG obtained from the Henry Phipps Institute. They became tuberculin-positive. In 1941 it was again offered and a smaller number of students volunteered. No overt incident attended the immunization, and the students reacted to tuberculin three months later. The speed-up program interrupted not only the follow-up, but likewise the continuation of the vaccination and an analysis of the results. By 1947, under the impact of the intensified interest in BCG created by the reports that if rigidly supervised it may have a place in anti-tuberculosis work, the Student Health Service again offered the vaccine to the medical students. Of 35 first-year medical students who were unreactive to tuberculin, 28 volunteered and received BCG. They all reacted to tuberculin three months later, but by the end of 1948, three had reverted to a negative state. Another group of 33 first-year medical students were vaccinated in April, 1948. By the time they enter clinical courses and increased exposure to the tubercle bacillus in the ward, nearly 98 per cent of the students will be tuberculin-positive. Despite the fact that the students were given the facts available concerning BCG and with the definite understanding that they were given an opportunity to participate in a critical evaluation concerning the merits of a procedure already in use in colleges of medicine in Chicago, Wisconsin and Ohio, some of the instructors on the subjects of tuberculosis and bacteriology unloosed a barrage of derogatory criticism against the action of the Student Health Service. The impact of this propaganda has been so vicious that when the members of the class of 1947 were asked whether they were glad or sorry for having received BCG vaccine, 20 of the 25 treated students promptly responded that they were sorry. In view of these developments it is only proper to inquire if newer knowledge justifies the antagonism and opposition at the University of California at a time when the students of the medical school of Western Reserve University appealed for greater protection against tuberculosis and were granted the privilege to receive BCG.

As a guide for further action, the following facts are of interest:

1. *Tuberculosis in the medical students in the San Francisco Bay Area.* The data of the University of California for the years 1942 to 1948 indicate that approximately 30 to 40 per cent of the students are tuberculin-positive on admission. By the time they are juniors, approximately 50 to 70 per cent have become reactive. The figures are quite in harmony with those recently published by Charles E. Smith, in which he showed that by the end of the senior year 72 per cent had reacted to tuberculin. The total "conversion" rate from tuberculin-negative to tuberculin-positive was 16.4 per cent in the junior and 16.2 per cent in the senior year. Smith made the same observation that the level of the tuberculin sensitivity as sophomores has been much lower in the last four classes. There is definite indication that the rate of conversion has declined; Smith ascribed this to the more careful elimination of exposure both in the classrooms and in the wards. In particular, he mentioned in a conversation that the examination of fresh autopsy material from the tuberculous has been discontinued. Lees likewise mentions that until recently only two or three members of the graduating classes in medicine at Pennsylvania remained tuberculin negative. In 1945 and 1946, however, the picture was as follows: fourth year, 70 per cent; third year, 64.4 per cent; second year, 55.8 per cent and first year, 43.6 per cent. This significant decrease reflects the general reduction of the incidence of tuberculous infection in the United States.

At the University of California Medical School, clinical tuberculosis has been diagnosed since 1945 in 1 junior, 2 seniors and 2 interns. Two had been tuberculin-negative and 3 tuberculin-positive when tested routinely in the second year of medicine. The problem of tuberculosis in the medical students in recent years is, therefore, not too serious in this instance. However, the appearance of cases during the intern years demands additional safeguards. It is doubtless advisable to protect these students in every way practical and the immunobiologic approach may be necessary.

2. *Further knowledge of the value of BCG vaccination.* (a) In general. The studies by Ferguson in Saskatchewan, by Aronson and Palmer among American Indians, by Rosenthal in Chicago, Hertzberg, Birkhaug in Norway, Wallgren in Sweden and Holm in Denmark have greatly enhanced the knowledge of BCG and fostered the hope that those unduly exposed to tuberculosis may have added protection. With the exception of the study of Aronson and Palmer, there exists a noteworthy lack of unassailable statistical proof of the effectiveness of BCG under rigidly controlled conditions in man, although such evidence is highly suggestive in animal

experimentation. Nevertheless, unanimity exists as to its harmlessness and incomplete, but significant protection against clinical pulmonary tuberculosis in adults. With scrupulous care, Aronson and Palmer analyzed the data on six years of the vaccination program for North American Indians. From February 1936 to February 1938 they vaccinated 1,550 persons from 1 to 19 years of age who failed to react to tuberculin. A similar group of 1,457 was not vaccinated. Both groups were followed-up for six years with annual tuberculin tests and chest x-ray examinations. At the end of this period they found among the 1,550 vaccinated persons *40* cases of tuberculosis and 4 deaths, whereas among the 1,457 nonvaccinated there were *185* cases of tuberculosis and 28 deaths. These observations have been detailed because they are generally quoted as the most convincing experimental study on the value of BCG, although it may be questioned whether the conclusions are transferable to civilized people having a higher degree of genetic immunity.

(b) Medical students, nurses and schools. Holm presented evidence in favor of BCG vaccination of medical students at the University of Copenhagen. Of 863 tuberculin-negative students, *52* presented positive x-ray changes in the lungs, while of 2,071 tuberculin-positive students *17,* or one third of the negative group, had positive chest x-ray findings. Positive x-ray findings were not encountered among 175 medical students whose reaction became positive after vaccination with BCG. The latest reports by Nordwall and by Heimbeck, covering observations over periods of 10 to 20 years, emphasize that the tuberculosis morbidity of nurses of 141.2 per 1,000 observation years resulting from natural primary infection in a hospital was reduced to 24.1 in the group vaccinated with BCG, and the mortality from 14.6 to 2.1, that is—to one sixth and one seventh, respectively. Rosenthal, et al., vaccinated 109 medical students at the University of Illinois. Over a period of four years there were no cases of pulmonary tuberculosis. Four cases were reported in the nonvaccinated groups. One of the most interesting and important observations on the value of BCG has been reported by Hyge in an epidemic of tuberculosis in one of the Danish State Schools in 1947. This school had 368 girl pupils between 12 and 19 years of age. They had been repeatedly examined for tuberculosis and 133 pupils had been vaccinated with BCG. There were 105 tuberculin-negative pupils who had entered since the last examination, and these were not vaccinated with BCG. In January and February, 1943, an influenza-like epidemic broke out, almost exclusively among the pupils. As several pupils presented erythema nodosum, the suspicion arose that the epidemic disease might be tuberculosis, and a thorough examination was made of the pupils and the school personnel. The source of infection was a female teacher with apical lesions; tubercle bacilli were found in the gastric washings. She taught exclusively in a poorly ventilated basement classroom. The classes which she taught included many whose negative tuberculin reaction had turned positive, as well as students with tuberculosis. The same condition prevailed in the classes that occupied the classroom immediately after her lessons. Among the students who were not taught by her and did not come into this room, no negative tuberculin reactors had turned positive, nor did any of them have tuberculosis. Follow-up examinations revealed that 40 per cent of her students had x-ray changes, and in 35 per cent tubercle bacilli were found as well; clinical pulmonary tuberculosis was found in 6.7 per cent of the 105 tuberculin-negative nonvaccinated pupils. Among the 133 BCG vaccinated pupils, clinical pulmonary tuberculosis was found in 3.1 per cent. It is most important to note, however, that the primary phenomena of illness occurred exclusively in the previously tuberculin-negative pupils and in no instance among the BCG vaccinated pupils. This furnishes, in the opinion of Hyge, strong proof for the protective role played by BCG vaccination in preventing the morbid sequelae ensuing upon a primary tuberculous infection. In comparing the BCG vaccinated group with the tuberculin-negative group, it is found that BCG vaccination has offered considerable protection against the development of pulmonary tuberculosis. By further comparison between the BCG vaccinated group and the tuberculin reactors by natural infection, it appears that BCG vaccination has given at least as effective protection against pulmonary tuberculosis as has natural infection. These investigations were not intended to demonstrate whether BCG had any effect, and therefore are of significance.

3. *Criticism and failure of BCG.* With the exception of the few contributions mentioned, the reports on BCG only too often tell little, but they tell it optimistically. In this connection, it is well to emphasize that the available information on BCG received an unbiased, critical appraisal by the British bacteriologist, G. S. Wilson. It should be read by everyone interested in BCG. Since it would lead too far to discuss his very sound arguments against the universal use of the vaccine, a part of his conclusions is herewith quoted. "Vaccination, if it is used, should be restricted to specially exposed groups, like nurses, medical students and children in tuberculous families." According to a recent report, the Minister of Health of Great Britain advised Parliament that plans to make trial use of BCG for professionally exposed groups are under consideration. Hilleboe, in detailing the position of the United States Public Health Service, stated that the effectiveness of BCG vaccination as an auxiliary method of tuberculosis control should be tested on persons exposed so intensely that they are almost certain to become infected. The studies should concern themselves with special groups, inmates and employees of mental institutions, employees of general hospitals and sanatoriums (where danger of infection is excessive because control measures are lacking), medical students in schools where the services include exposure to tuberculous patients and other exposed groups.

The many critical papers on BCG published during the past two years reflect the position taken by the Medical Section of the American Trudeau Society in the blunt statement that further studies are necessary, in fact, imperative to determine the value of BCG. It cannot be regarded as a substitute for approved public health measures, nor can the vaccination of the general population be advocated. However, in the light of pres-

ent knowledge, vaccination of doctors, medical students and nurses who are exposed to infectious tuberculosis and all hospital and laboratory personnel whose work brings them in contact with the bacillus of tuberculosis is recommended.

These authoritative statements have been opposed for the following reasons: (1) The use of BCG destroys the value of the most potent weapon in finding those who are infected with tuberculosis—the tuberculin test. This criticism does not apply to medical students and nurses who are regularly subjected to roentgenograms. This is done at three-month intervals as soon as reversions have been detected. (2) Tuberculosis among students of nursing and medical schools has been brought under control through the use of well-established and dependable methods which are more satisfactory than through the use of BCG. This is probably true for many schools. The data which in recent years have been collected clearly indicate that demonstrable lesions develop relatively infrequently among students. But the recent findings must be appraised in the light of future observations. If the risk of exposure is definitely eliminated, the Student Health Service would have little justification for promoting the use of BCG.

3. Some of the opponents have offered another means of controlling tuberculosis. It deals with the use of streptomycin or any other effective antibiotic in the early stages of tuberculosis. The Student Health Service would administer the drug to every tuberculin reactor, even in the absence of all other findings, and thus prevent through chemoprophylaxis the development of progressive tuberculosis. Unpublished observations and theoretical considerations furnish little support to encourage this procedure.

Anyone familiar with the problems of BCG fully realizes that the important problems of virulence and stability of a vaccine composed of live organisms require careful consideration. Techniques of preparation of a potent and stable vaccine must be standardized, and the best method of vaccination must be developed. Until further research offers answers to the many questions, it is doubtless premature to consider the commercial licensing for the sale of BCG. Work along these lines is in progress, but several other questions, for example, How much immuinty does BCG vaccination confer? and How long does such immunity last? can be answered only after long-range studies under proper scientific supervision and control. That the immunity conferred by BCG may sometimes be inadequate is recognized by Bergqvist who, according to an abstract of his article, described a tuberculosis epidemic in the School of Dentistry in Stockholm.

In September, 1944, radiographic and tuberculin examinations were undertaken of most of the 115 students admitted to the school. A year later one of these students was found to be suffering from pulmonary tuberculosis. A few weeks later several of his fellow students showed signs of tuberculosis, and there were a total of 18 such cases. Among 57 students who had from the outset been tuberculin-positive and who had not been given BCG, there were 4 cases (7 per cent), and among 44 students who had been given BCG, there were 10 cases (23 per cent). Among 12 tuberculin-negative students who had refused BCG vaccination, there were 4 cases (33 per cent). Only in 2 or 3 cases was the prognosis bad, and as many as 13 or 14 of the 18 students in whom signs of tuberculosis developed were able to resume their studies. Investigations are being undertaken to ascertain if the tubercle bacilli responsible for this epidemic were of a particularly virulent type. The reasons why the immunity achieved by BCG proved inadequate have not been satisfactorily determined.

4. *Measures to reduce exposure of medical students to tuberculous infection.* The analysis made in 1940 presented little concrete evidence relative to the sources of tuberculous infection which contributed to the incidence of tuberculosis in medical students. Aside from the open tuberculosis wards, casual contact exposures which might be encountered during the clinical years through examination in undiagnosed cases of tuberculosis in various ward services and in the out-patient departments were suspected. Recent studies by Hedvall of Lund University and particularly the thorough epidemiologic inquiries by Meade at the University of Rochester Medical School definitely incriminate contact with tuberculous materials in autopsy rooms and laboratories. After more stringent precautions were adopted which provided that students were not permitted to participate in autopsies in known cases of tuberculosis or to handle tuberculous material, both the infection rates and the incidence showed striking reductions. According to Lee, the University of Pennsylvania Medical School pays attention to the autopsy room technique with the result that infections have been very materially reduced.

Summary and conclusions. The immunobiologic method of prophylaxis continues to furnish excellent protection of students against smallpox, diphtheria and such diseases. Its value in the control of tuberculosis deserves further careful investigation.

Since 1940 the rates of tuberculous infection among medical students as measured by the rate of conversion from tuberculin unreactive to reactive, and by the incidence of clinical tuberculosis has definitely declined from the surprisingly high rates during 1930 to 1940.

This reduction reported from western, midwestern and eastern medical schools is in all probability attributable to enforcement of protective measures in pathology departments which reduce the risk of exposure. It may likewise reflect the gains made in the over-all general control of tuberculosis in the United States.

The many critical papers published in recent years justly condemn the indiscriminate use of BCG vaccination. However, they invariably agree that the procedure is safe, and they recommend the use of the vaccine for doctors, medical students, laboratory workers and others who are exposed to infectious tuberculosis. The recommendations of the University of California Committee made to the University physician in 1940 require no changes. Since cases of clinical tuberculosis continue to

occur among the students, the Health Service is fully justified in recommending its use on a voluntary basis.

However, it is only proper to insist on annual critical appraisal by qualified epidemiologists and immunologists of the tuberculosis infection trends among the students in order to decide whether or not BCG vaccination is really needed to give the young men and women added protection.

BCG vaccination, whenever practiced on medical students, should be supervised competently and treated as a scientific experiment.

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POSTGRADUATE COURSE

The Department of Postgraduate Medical Education, University of Minnesota, announces a continuation course in Dermatology for general physicians to be held at the Center for Continuation Study May 26 and 27. The course will be devoted to the diagnosis and management of the common skin disorders.

Fungus Diseases of the Lungs

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While we have few cases of fungus diseases of the lungs in this area, they occur with sufficient frequency to justify their consideration in the differential diagnosis of any obscure pulmonary condition. Some of the mycoses, such as moniliasis, geotrichosis, and actinomycosis, are endogenous and may occur at any time, in any climate, and in any level of society. Others, such as coccidioidomycosis, histoplasmosis, and American blastomycosis, have limited geographic distribution. However, with increasing intersectional travel, diseases which were once considered to be endemic to certain isolated areas may appear far removed from their original locale. This was well demonstrated in the Armed Forces during the war. Correct identification of any fungus isolated is extremely important so that innocent saprophytic organisms are not given as the etiology of an obscure condition, thus masking the true pathology.

Actinomycosis

One of the most common of the severe systemic mycotic infections is actinomycosis. A discussion of this disease is difficult because of the confusion regarding both the nomenclature and the pathogenicity of the various species of actinomycosis found in the literature. Henrici and Waksman [1] in 1943 offered a new classification, which, when generally accepted, will help to eliminate this confusion.

It is repeatedly noted in the literature that actinomycosis may be caused by two different fungi, although the clinical course and therapy are the same. The first organism, Actinomyces bovis, is anaerobic and difficult to culture. It is credited with causing approximately 90 per cent of the infections and, according to Skinner, Emmons, and Tsuchuya,[2] should be considered the only cause of true actinomycosis. The second organism, Nocardia asteroides, is aerobic, is easily grown in culture, and, according to Skinner, Emmons, and Tsuchuya, gives rise to a similar but different clinical entity.

Actinomycosis bovis occurs as a saprophyte, especially in the mouth of man and some of the domesticated animals, such as the cow. It has been found in the tonsils and between the teeth of normal individuals. Such fungi are ideally located to be aspirated into the lungs, where they set up a pulmonary infection. Nocardia asteroides is reported to be common in soils; Actinomycosis bovis, however, has never been cultured from soil nor from stems of grass.

Actinomycosis affects many parts of the body, most frequently the head and neck, next the abdominal cavity, and third the lungs and thoracic cavity. While this pulmonary condition is relatively rare, it is of considerable importance because of its high fatality rate. The symptoms in the first few weeks of a pulmonary actinomycosis are those of any subacute pulmonary infection, with fever, cough, and mild expectoration. As the disease progresses, it resembles advanced tuberculosis or lung abscess resulting from some other cause. The infection usually extends to the pleura and to the ribs; occasionally pleural effusion develops, but more often the infection extends directly to the ribs and to the subcutaneous tissues. Subcutaneous abscesses and draining sinuses may develop. The sedimentation rate and leucocyte count are elevated. The physical signs are the same as those in tuberculosis, except that actinomycosis more often involves the base of the lungs and is usually bilateral.

The x-ray picture often shows massive areas of consolidation without cavitation, or with small irregular areas of rarefaction. As a rule, the lesions are found bilaterally in the lower lobes, but any part of the lung may be included. In advanced cases, the pleura is usually involved with adhesions or with pleural effusion. The ribs frequently show both destructive and proliferative changes. Occasionally areas of consolidation project from the mediastinum and give the appearance of neoplasm. There is nothing characteristic in the x-ray picture that will differentiate actinomycosis from other chronic pulmonary infections. The diagnosis must be established by isolation and identification of the causative organism.

Actinomycosis presents a varied clinical picture and must be differentiated from tuberculosis, syphilis, neoplasm, osteomyelitis, blastomycosis, coccidiomycosis, cryptococcosis, sporotrichosis, and botryomycosis. This last-mentioned disease, botryomycosis, is caused by a granule-producing staphylococcus and gives rise to chronic draining abscesses. Such a case was recently reported by Doctors Campbell and Plimpton at a meeting of the Staff of the Abbott Hospital in Minneapolis, in which a draining sinus followed an appendectomy.

The prognosis in pulmonary actinomycosis is grave, but it is much better since the introduction of the sulfonamides and penicillin. Up to 1940, four methods of treatment were generally used: iodine, thymol, x-ray irradiation, and surgery. None of these offered satisfactory results unless the infected tissue could be completely excised. Since 1940 numerous authors have reported recovery from serious infections with sulfonamide therapy. Lyons, Owens, and Ayers,[3] however, concluded in 1943 that dramatic initial response of these infections to sulfonamides is somewhat misleading. The drugs induce a remission and apparently diminish the intensity of the recurrence, but it can hardly be claimed that the disease has been completely cured. As early as 1941, Florey and his associates reported that certain strains of actinomyces were inhibited by penicillin *in vitro*. These observations have since been confirmed by other workers. In September 1943, Herrell and Nichol [4] reported a case

they had tried clinically; and since 1943 there have been many reports in the literature of remarkable cures of actinomycosis with penicillin and with penicillin and sulfonamide mixtures. Sulfadiazine seems to be the sulfonamide of choice. Many authors have suggested the use of potassium iodide with penicillin and sulfonamides.

I have had three cases which responded favorably to chemotherapy. In one the Actinomyces bovis grew in a culture to which sulfathiazole had been added, and in a culture containing penicillin, but was definitely inhibited in a culture to which a mixture of the two compounds had been added. The combined therapy was given to the patient, who had a large lung abscess, for a period of five weeks, with marked clinical and x-ray improvement. Unfortunately, the patient left the hospital against advice and we were unable to follow his further progress.

In the second case, a 27-year-old man was observed for several months with pneumonitis in the lower lobe of the right lung before Actinomyces bovis was isolated. After the diagnosis was established, he was given two courses of penicillin and sulfadiazine with clinical and x-ray recovery of his pulmonary condition.

The third case was that of a 26-year-old colored man who suffered from a chronic bronchopneumonia and pleurisy with a febrile course for a period of 10 months. He developed several areas of decreased density in the ribs. One of these was explored surgically and a cavity having the appearance of a cold abscess was described. The microscopic appearance was that of caseating tuberculosis of the bone. Acid-fast granular organisms were seen in the smears made from the fresh tissue. A diagnosis of tuberculosis was considered, but culture for tubercle bacillus was negative. Later a needle biopsy from another of these rib lesions revealed on culture the aerobic acid-fast Nocardia asteroides. The patient was given penicillin 40,000 units every three hours for a total of two and a half million units, plus sulfadiazine in doses sufficient to maintain a blood level of 10 milligrams per 100 cc. This therapy resulted in recovery from the disease.

With longer experience and increased supplies of the drug, the dose of penicillin has gradually been increased; and recent evidence indicates that extremely large doses, 1,000,000 units daily for four to six weeks, may be more effective.[5]

In addition to chemotherapy, in cases in which adequate drainage is not obtained through the bronchus, surgical drainage and wide excision of necrotic tissue should be carried out. Dr. Owen Wangensteen, of the University of Minnesota, had conducted studies before the advent of the present-day chemotherapeutic and antibiotic agents, and his conclusion that necrotic tissue should be removed still holds today. The prognosis is much brighter with a combined therapeutic approach.

Coccidioidomycosis

Coccidioidomycosis, caused by the coccidioides immitis, occurs as either a benign, acute infection, or as a chronic, malignant one. Formerly the chronic condition, which is a progressive, disseminated disease involving the cutaneous, visceral, and osseous tissues, was the one known and feared. Today coccidioidomycosis is recognized in epidemic form, particularly during the dry, dusty months in endemic areas; and only a small percentage of the cases progress to the malignant form. The disease was first described in the endemic type in the San Joaquin Valley in California and was known locally as valley fever. During the war, troops stationed in the semi-arid regions of the southwestern states, especially California, Arizona, and western Texas, were subjected to this infection; and several epidemics were reported. Positive skin tests with coccidioidin have been reported in from 60 to 80 per cent of the inhabitants of certain areas. Rodents in the endemic area have also been found infected with coccidioides immitis.[6] Smith[7] at Leland Stanford University has studied coccidioidomycosis thoroughly and has given us a good picture of the disease.

Although primary skin lesions have been reported in a few isolated instances, the important portal of entry is the respiratory tract. The incubation period varies from 8 to 21 days. The symptoms of primary pulmonary coccidioidomycosis, in the average case, are indistinguishable from those of an acute upper respiratory infection, and the pneumonitis may not be suspected unless a roentgenogram is made. Occasionally the symptoms are more severe and simulate those of lobar or lobular pneumonia. Still other cases may imitate pulmonary tuberculosis. Smith[8] has stated that coccidioidomycosis can mimic every type of picture seen in pulmonary tuberculosis.

In an epidemic which occurred in 85 soldiers, Goldstein and McDonald[9] reported the incubation period to vary from one to three weeks. Fever was present in 100 per cent, cough in 88 per cent, pain in the chest in 88 per cent, chills in 66 per cent, sputum in 65 per cent, sore throat in 37 per cent, and hemoptysis in 18 per cent of these cases. Physical signs were present in only 26 per cent, and these were largely limited to alterations in breath sounds. Dullness and rales were rare. Erythema nodosum developed in 19 per cent, erythema multiforme in 2.6 per cent, morbilliform rash over the trunk and lower extremities in 4 per cent, and arthralgia in 28 per cent. These allergic reactions appeared 8 to to 14 days after the onset of symptoms and were usually accompanied by eosinophilia.

Colburn[10] reported the x-ray studies made in these same 85 soldiers with primary coccidioidomycosis. No detectable x-ray changes were found in 4 per cent. Fan-shaped densities extending out from the hilus were present in 38.7 per cent. These lesions required from 15 to 90 days to resolve, with an average of 40 days. In 24 per cent, hilar adenopathy was present without parenchymal involvement of the lung. In an additional 26 per cent, there were both peripheral and sublobular infiltrations in the upper and lower lobes. Thin-walled pulmonary cavities, which are characteristic of the disease, developed in 4 per cent. Some of these cavities healed in 60 days and some in 95 days, while others persisted. Cavities of this kind have been known to re-

main for years. From 1942 to 1946 I had the opportunity to study a large number of cases of subacute pulmonary coccidioidomycosis at an Army chest center, and this thin-walled cavity was the most consistent and characteristic x-ray picture. Some of these were watched over a period of months and showed very little change. Occasionally calcification occurred in both the peripheral lesion and in the hilar nodes.

The diagnosis is made from the clinical story plus isolation of the organism from the sputum. The sputum is examined either directly in 10 per cent sodium hydroxide or by culture on Sabouraud's media. Skin test with coccidioidin is also helpful. This test is made with 1:1000 coccidioidin and read in the same manner as a tuberculin test. Precipitin and complement-fixing antibodies are absent in mild cases, but are present in more severe ones. These antibodies disappear with recovery. The acute disease must be differentiated from other acute pulmonary infections, while the more severe progressive type must be distinguished from tuberculosis, syphilis, glanders, tularemia, osteomyelitis, neoplasms, and other mycoses.

The prognosis is excellent in primary pulmonary coccidioidomycosis, and is good in the cutaneuos and glandular types of primary infection; but the outlook is grave in the progressive form, and most victims eventually die. However, only a few of the primary infections develop the disseminated form of the disease. Among the cases mentioned above, we saw only two patients with the progressive type. One died from coccidioidomycosis meningitis. The second had generalized bone involvement with a draining sinus in one clavicle from which the organism could be isolated. This second case had been studied at Leland Stanford University by Dr. C. E. Smith's staff, and the diagnosis was established by them before he was seen by us.

The treatment is symptomatic. The patient should be kept in bed until his temperature and white blood cell count are normal and the x-ray films are also normal or show progressive clearing. Most cavities heal with rest and time, but the larger ones which fail to heal may require lobectomy. There is no known specific treatment.

North American Blastomycosis

North American blastomycosis is a fungus infection of man and animals, caused by a double-contoured, budding, yeast-like organism, blastomyces dermatitidis. This organism is not a true yeast, however. On Sabouraud's medium a fuzzy, white, aerial growth develops. On blood agar the fungus produces the round or oval blastomycetes which has a thick doubly-refractive cell wall and cytoplasm containing refractive granules and vacuoles. In the tissue and on blood agar the organism reproduces by budding. The organism is not spread from man to man, but is derived from some source in nature. The disease occurs much more commonly in males than in females. Many of the reported cases of the systemic type have been in indigent people living in a damp, unhygienic environment. Martin and Smith [11] in 1939 published a review of the disease and reported in detail several cases of their own. Smith [12] reported the disease as being found anywhere in North America, with the greatest frequency in the Mississippi valley, across Tennessee, and down into North Carolina.

Cutaneous blastomycosis is the common form of the disease and the most frequently infected skin areas are around the nose and eyes, on the back of the hands, and the front of the legs. The infection may begin in the skin and remain localized for months or years before it spreads to the internal organs. Bell [13] states that one-half the systemic cases start this way; the other half begin as respiratory infections. Invasion of the blood stream from the lungs may result in widespread metastatic abscesses involving any organ or tissue.

The onset of pulmonary blastomycosis may be insidious. The symptoms may resemble those of an acute or subacute pulmonary infection with dry cough, pain in the chest, and fever. As the disease progresses, it may simulate massive tuberculosis. The mediastinum may be invaded. The pleura may be affected and draining sinuses may develop in the chest wall as they do in actinomycosis. In the terminal stages, symptoms due to invasion of other internal organs may develop, such as pain in the bones or prostate, or paralysis from extension to the central nervous system. The physical findings are similar to those of massive pulmonary tuberculosis or lung abscess.

The x-ray film in the early stages may show enlargement of the mediastinal lymph nodes without obvious parenchymal involvement. Usually, however, dense infiltrations are seen. The pulmonary density frequently suggests neoplasm. I have studied two cases of pulmonary blastomycosis. One was diagnosed as a neoplasm, and the correct answer was not found until after a pneumonectomy. The patient died after the surgery. The second case was observed for several weeks as a case of far-advanced pulmonary tuberculosis, but the doubly-refractive budding, yeast-like organism was isolated; and the correct diagnosis was made antemortem by Dr. Williams of Nopeming, Minnesota.

A positive skin test to blastomyces vaccine develops in the more extensive skin cases and in almost all of the systemic ones. The diagnosis is made by isolating the blastomyces from the sputum. Tuberculosis, syphilis, neoplasm, lung abscess, sarcoidosis, silicosis, actinomycosis, coccidioidomycosis, sporotrichosis, and moniliasis must be considered in the differential diagnosis.

The prognosis is extremely unfavorable in the systemic disease, the mortality rate being reported at about 90 per cent. Iodides have been used but seem to have little effect on the infection and may even cause a rapid spread of the disease. Martin and Smith recommend partially desensitizing the patient by injecting increasing doses of a skin-testing material prepared from the fungus until little or no reaction is elicited. Following this desensitization, iodides can be safely given and sometimes this combination may cure the infection. Surgical drainage and excision of necrotic tissue should be carried out

as in actinomycosis. The mortality from the cutaneous type of the disease is low; here, iodides seem to be beneficial.

South American Blastomycosis

South American blastomycosis is a fungus infection beginning in the skin and mucous membrane, but eventually involving the internal organs. The disease is caused by infection with a fungus that resembles coccidioides immites. It reproduces by multiple budding and has been given the name Blastomyces brasiliensis. The largest incidence of the disease is reported in Brazil, from which it derives its name; but sporadic cases have been reported in other South American countries. In contrast to North American blastomycosis, where 50 per cent of the cases start as a respiratory infection and pulmonary involvement is present in over 90 per cent of the cases, in South American blastomycosis the lungs are involved late and in only about 20 per cent of the cases. Sulfadiazine is reported as the drug of choice in treatment, but most of the reported cases have had a fatal termination. A good summary of the literature has been written by David T. Smith.[14]

Cryptoccosis

Torulosis, or cryptoccosis, is caused by Cryptococcus neoformans (also known as Torula histolytica and European blastomycosis). This organism is a true yeast. The disease is widespread throughout the world. Although the portal of entry is believed to be the respiratory system, the organism shows marked predilection for the brain and meninges. The pulmonary lesions have been described as miliary nodules, large gelatinous masses, chronic lung abscesses, and chronic bronchopneumonia. There is nothing characteristic about the plumonary symptoms, signs, or x-ray pictures of patients with cryptococcosis. The pulmonary lesion must be differentiated from tuberculosis, actinomycosis, North and South American blastomycosis, coccidioidomycosis, moniliasis, and other non-tuberculous infections.

The prognosis is grave and no specific therapy is known. Some favorable results have followed the use of sulfadiazine, but there have been reported cases of spontaneous recovery; so the efficacy of the sulfonamides must await further trial.[15]

Histoplasmosis

Histoplasmosis is a fungus disease caused by Histoplasma capsulatum. The first three cases were described in 1905 and 1906 from Panama by S. T. Darling.[16] The fourth case, 20 years later, was reported from Minnesota, by Riley and Watson.[17] Since 1926, less than one hundred cases have been reported.

Histoplasma capsulatum occurs in the tissues in the form of small, round or oval, yeast-like bodies, which measure from one to five microns in diameter. They show a sharply-defined, clear, achromatic capsule. The chromatic mass in the center is irregular in distribution. The fungus grows slowly on the commonly-used media, but usually it is hard to isolate because of contamination by other organisms. If grown on a medium rich in protein at 37° C., the yeast-like form appears, but at room temperature the mycelial form develops.

The infection manifests itself in many different forms. There may be ulcerative lesions of the skin and of the mucous membranes. There may be localized or generalized lymphadenopathy. Most of the viscera may be involved, or only one organ may be affected, such as the adrenal. The intestinal tract is frequently the site of ulcerated lesions. Parsons and Zarafonetis[18] in 1945 reported seven cases and reviewed 71 from the literature. They found the disease to be sporadic and widespread throughout the tropical, subtropical, and temperate zones. No race is exempt. Males seem to be infected much more often than females. Every age group is susceptible.

They reported from the 71 cases that cough was present in 11, rales were mentioned in 13, and a friction rub in 4 cases. A diagnosis of pneumonia was made eight times. In 11 cases a diagnosis of tuberculosis had been considered before death. The clinical evidence for tuberculosis in these cases had been apical opacities and cavities seen by x-ray, miliary lesions scattered throughout the lungs, or acid-fast bacilli in the sputum. In some of these 11 cases the two diseases existed together at autopsy. The lungs rarely if ever are the primary site of infection and they seldom show the most extensive lesions.

These same authors found that the great majority of the infections last less than one year. Four patients were still living at six, five, two, and two years after the diagnosis was established. Three of them had ulcerative lesions on the tongue as the only presenting sign of histoplasmosis. No form of treatment has been found that appears to alter the course of the disease.

Parsons and Zarafonetis, in discussing the antemortem diagnosis, stated that the yeast-like organism of hystoplasma capsulatum may be seen in the monocytes and neutrophiles of a smear of circulating blood. The organism was thus demonstrated in four of their cases. However, some of these were in review of the blood smear after the autopsy. The organism also has been found on examination of smears of bone marrow and in culture of bone-marrow material.

While isolation of the organisms is at present the only definite method of diagnosis, skin tests are being developed. Inoculation has been found successful in several laboratory animals, including mice, guinea pigs, rats, rabbits, dogs, monkeys, and chick embryos.

I saw one case of histoplasmosis in 1945. The patient came in with melena and was admitted to the hospital. No cause for the bleeding was found. About one week after admission, he expired suddenly in a state of shock. At autopsy, large granulomata were found in each adrenal. The organism was demonstrated on microscopic examination and isolated in cultures.

Following this case and because of interest created by the recent publication of Parsons and Zarafonetis, we became excited when one of the technicians pointed out a yeast-like organism in the blood smear of a patient with clinical bacterial endocarditis. Dr. Henry Bradford,

now of Denver, asked me to do a sternal puncture. I made some direct smears from the bone marrow, stained them, and found the same yeast-like organisms we had seen in the blood smear. It appeared that we had another case of histoplasmosis until the next day, when we found there was some kind of yeast growing in the bottle of stain we were using. The patient's blood cultures later showed streptococcus viridans. He was treated for six weeks with penicillin and apparently recovered. This experience again emphasizes the care that must be taken to identify any fungus isolated.

Moniliasis

Monilia or Candida are found frequently on the mucous membrane and skin. These fungi reproduce by budding and at times by formation of mycelium but do not produce ascopores. Of all the species of Candida, only Candida albicans is reported to be pathogenic. Ten to fifteen per cent of normal individuals harbor candida albicans in the mouth or throat, so the mere demonstration of this fungus does not mean that the disease present is caused by it. Bell [19] states that Monilia albicans "only seems to be pathogenic for man"; and Colonel Geo. F. Aycock,[20] who was Chief of Medicine at Fitzsimmons General Hospital and had had many years' experience in pulmonary diseases, stated that he had been looking for a proved moniliasis for 30 years, but he still was not sure he had seen one.

The disease is described as causing chronic bronchitis. Occasionally pneumonitis or bronchopulmonary moniliasis is reported. The disease has no characteristic x-ray findings, showing only a non-specific type of peribronchial thickening. A peculiar, hazy type of linear fibrosis has been described. Physical findings are those of a chronic bronchitis. The favorable response to postassium iodide is given as evidence that the disease is caused by Candida albicans. Other less common pulmonary fungus infections result from geotrichosis, sporotrichosis, aspergillosis, penicilliosis, mucormycosis, and coniosporiosis.

In conclusion, it should be re-emphasized that while these diseases of the chest are not common in this area, it is still a fact that every patient with an undiagnosed pulmonary condition is a potential victim of a fungus infection. Unless this possibility is kept in mind, many cases wll not be recognized or will not be diagnosed until autopsy. On the other hand, knowing that fungi occur universally, we must establish a positive identification of any and all fungi isolated. Recent developments in chemotherapy and antibiotics ahve changed the prognosis of many of these infections. We may look forward to new therapeutic agents which will offer cures for most fungus diseases. As specific treatment becomes available, it is increasingly important that an etiological diagnosis be made and the proper therapy be instituted.

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COURSE IN HEMATOLOGY AND ALLERGY

The Department of Postgraduate Medical Education, University of Minnesota, announces a continuation course in General Medicine to be held at the Center for Continuation Study May 12, 13, 14. The course will be devoted to lectures and clinics on Hematology and Allergy. Particular emphasis will be placed on methods of diagnosis and treatment of the various allergic states.

Pneumonotomy with Open Drainage of Tuberculous Pulmonary Cavities (Cavernostomy)

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Most of the older attempts at open drainage of tuberculous pulmonary cavities reported in the literature* were marked by an apparent lack of consideration for the other pulmonary lesions. The recent paper of O'Brien et al.[7] contained a number of cases among others where, due to complicating cardio-respiratory difficulties, apical sclerotic cavities were drained without previous thoracoplasty which was so stressed by Eloesser, Shipman and Rogers.[12] The latter authors, however, were concerned principally with residual tension type cavities and they emphasized a valvular opening in the thorax produced by a cutaneous flap. However, a limited thoracoplasty was performed by them.

All cases in this series were far advanced, bilateral, and of the poor risk type. The average duration of disease prior to pneumonotomy was eight years. Pneumothorax was attempted in all cases, and in addition, these patients had submitted to an average of six operative procedures. Eight patients had preoperative hemorrhages with none since. Eight patients had bronchial disease, two with sepsis, which improved. Nine had contralateral pneumothorax or thoracoplasty.

There were 23 patients in the series under consideration upon whom 24 pneumonotomies were performed. Seventeen were operated on from two to five years ago, and all followed to-date (Fig. 1). Fourteen had a recurrent, new or residual cavity beneath apparent maximum thoracoplasty, two of which had a paradoxical chest wall due to excessive formalization. Five patients had a recurrent or residual cavity where thoracoplasty was not maximum, but could not be extended because of bronchial disease; contralateral collapse; unstable contralateral lesion; and other complications. Three had isolated lower lobe cavities over diaphragmatic paralysis, with good upper lobes. One with an isolated giant upper lobe cavity with contralateral pneumothorax and respiratory embarrassment improved after drainage.

It would appear that other pulmonary tuberculous lesions, particularly in the regions adjacent to the cavity, probably should be relatively stable or have good possibilities of control. The trauma incident to operation and the contraction of fibrous tissue in obliterating the healing cavity must affect the adjacent lung areas biologically as well as mechanically. In all the patients of this series the lesions surrounding the cavitation had been brought under at least the partial effect of some collapse procedure.

In these patients there was present either a single cavity or a multiloculate cavity with communicating chambers within the lung at the time of operation. It would seem possible to drain a closely adjacent but separate cavity at the same time.

Case	*Pneumonotomy*	*Indications Used*
1.	S. 3/42	Cavity beneath revised 9-rib thoraco.[2] Diaphragmatic paralysis.
2.	S. 4/42	Recurrent cavity beneath 6-rib thoraco.[2] One kidney with occasional anuria. Bil. bronchial stenosis.
3.	S. 11/42	Contra. pnx. Residual cavity beneath 5-rib thoraco. Early respiratory embarrassment.
4.	S. 2/43	New cavity, left, below bil. thoraco., 5-rib. Granulomatous bronchial lesions and hemorrhages.
5.	S. 2/43	Cavity beneath revised 7-rib thoraco. and ant. stage.
	6/45	Second recurrent cavity adjacent to above situation.
6.	S. 4/43	Recurrent multiple cavitation beneath thoraco.[2] Sepsis, bronchiectasis, bil. bronchial stenosis.
7.	S. 10/43	Residual cavity beneath 7-rib thoraco. and anterior [2] stage. Neurologic and G.U. problem.
8.	S. 1/44	Multiloculated residual cavitation beneath 7-rib thoraco. supplemented by anterior stage. Contra. pnx.
9.	S. 1/44	Residual lower lobe cavity over diaphragmatic paralysis and pneumoperitoneum. Hemorrhages, mild bronchial lesion. Remaining upper lung good.
10.	S. 2/44	Residual cavity as unable to tolerate stages of thoraco. close enough together to prevent regeneration due to hematologic and G.I. complications.
11.	S. 2/44	Residual cavity after insufficient thoraco. which was not extended because of contra. spread thought to need collapse.
12.	S. 3/45	Recurrent cavity beneath 7-rib and ant. thoraco. Bronchial lesions.
13.	S. 4/45	Residual cavity beneath 7-rib thoraco. and contra. pnx.
14.	S. 4/45	Recurrent cavity beneath 7-rib and ant. revised thoraco.
15.	R. 6/45	Residual cavity after 7-rib thoraco.[2] and contra. pnx.
16.	P.R. 12/45	Residual cavity after 7-rib thoraco.[2] and contra. pnx. Paradoxical movement of chest-wall from lack of rib regeneration.
17.	P.I. 12/45	Residual cavity after 7-rib thoraco.[2] due to lack of regeneration of rib bed probably from formalin. Paradoxical chest wall; marked respiratory embarrassment.
18.	R. 4/47	Residual cavity after extensive 8-rib thoraco.[2]
19.	R. 6/47	Residual lower lobe cavity over diaphragmatic paralysis, with good upper lung. Contra. empyema.
20.	C. 6/47[1]	Residual lower lobe cavity over paralyzed diaphragm and pneumoperitoneum. Fair upper lobe. Streptomycin.
21.	P.S. 7/47[1]	Giant upper lobe cavity. Contra. pnx. Marked respiratory embarrassment.
22.	H. 9/47	Residual cavity after revised 9-rib thoraco. and anterior stage. Bronchial disease. Coronary occlusion.
23.	H. 9/47	Residual cavity after twice revised 7-rib thoraco. and anterior stage. Contra. pnx.

S.: Sunnyside Sanatorium, Indianapolis. P.: Private. R.: Rockville Sanatorium, Rockville, Ind. I.: Irene Byron, Fort Wayne. C.: City Hospital, Indianapolis. H.: Healthwin, South Bend, Indiana. 1: 2 stage. 2: Performed by others.

Fig. 1.

It would be, no doubt, good judgment to have lesions in the contralateral lung under control or at least good possibilities of same before proceeding with pneumonotomy. The impression has been gained that pneumonotomy could be performed where contralateral lesions were slightly more unstable than the condition required for thoracoplasty, because there has been less reaction to the operation and little collapse effect.

Where thoracoplasty had been performed and it appeared that drainage might be necessary, a period of several weeks was allowed to elapse before operation was considered in order that the tissue planes became sealed and the maximum effect noted from the collapse.

The cavities were localized by planigrams. Preparation for the operation was the same as for thoracoplasty including postural drainage. All anesthetics were local plus intercostal nerve block occasionally supplemented with sodium pentothal. The approach was made in the region where the cavity was situated closest to the chest wall.

The patient was placed in the position of lateral recumbency and a paravertebral incision made in the region of the old thoracoplasty scar where such existed. The deep muscles of the chest were divided. Usually, electrocoagulation or suture was used for hemostasis throughout the operation. Several centimeters of the ribs or regenerated bone were removed over the region of the cavity. The resection was not extended more than necessary because of the danger of creating a dead space which might become infected. For like reason, the periosteum was carefully left on the unresected ribs. The intercostal vessels were doubly ligated and the intercostal muscles, nerves and vessels, together with the remaining periosteum were excised over the area.

In order to avoid empyema, it was well ascertained that the pleurae were densely adherent. A needle connected to a manometer and syringe was used to locate the cavity. Then, with the electro-cautery, an incision was made slowly along the needle through the pleurae, lung and cavity wall. This was dried and explored and then completely unroofed over its widest diameter. It was observed that the more widely the cavity was opened to the exterior without cutting excessively into lung tissue, the better it appeared to heal and obliterate. This is true particularly where nontension sclerotic cavities are concerned. There was ntaurally less shelving and pocketing with good drainage. If daughter chambers were present, they were opened widely into the main cavity by excising the outer peripheral portion of the partition.

Exposed lung tissue and bleeding points were well coagulated or sutured, if necessary, to avoid air embolism and postoperative hemorrhage. No large vessels were encountered as the blade was only used in the lateral periphery of the cavities and the mediastinal aspects were avoided. Strands crossing the cavity were ligated even if fibrosed. The remaining medial cavity wall was coagulated to destroy it as much as possible.

The deep muscles of the chest were sutured over the exposed rib ends to the pleura if possible and approximated somewhat at either end. A large skin flap was dissected up laterally after the method of Eloesser [11] and the free end sutured to the cavity wall or pleura. These flaps appeared later to keep the wound open and also acted as a point from which epithelization took place over the deeper parts of the wound. Likewise the medial edge of the skin was sutured to the muscles and each end of the incision brought together to some extent. Chromic catgut No. 1 was used as the suture material for closure. The wounds were loosely packed open with gauze and vaseline strips placed around the wound edges to protect the soft tissues where wounds were widely open (Fig. 2).



Fig. 2.

The two stage procedure with gauze pack should be used where the pleurae are not adherent and the tissue planes are not sealed by previous surgery. In only one case was it necessary to administer plasma for the prevention of shock. The patients otherwise tolerated the procedure as well as a small second stage thoracoplasty, if not better.

The postoperative care consists of a long period of daily light packing with gauze which may be soaked in penicillin, streptomycin, tyrothricin or codliver oil to keep the wound as clean as possible. Occasional stimulation of the granulations with silver nitrate or the cautery is beneficial. After about nine months of such management, if the wounds are not nearly healed, a plastic closure of the defect may be considered in most cases. There is apparently too much active infection present to attempt closure before this time though streptomycin may alter this consideration.

The wound is prepared for several days with wet dressings and antibiotics are administered and continued postoperatively. A plane of cleavage is established between the granulation tissue and the underlying tissues and the former is bluntly dissected out of the defect. The defect

is then obliterated by reapproximating the tissues in layers with interrupted number 20 and 40 cotton thread; thus suturing lung to lung, pleura to pleura, etc. If a bronchial fistula is present, in addition a pedicled muscle graft is obtained from the adjacent musculature and sutured into the orifice of the bronchus.

Seven plastic closures of sinuses and fistulae were performed, five of which healed and two broke down. These were two of three closed between three and nine months after the pneumonotomy, while all of those repaired at a later postoperative date healed. Of the 17 patients followed for over two years, seven have healed wounds (2 spontaneous and 5 plastic closures); two patients are dead, and another will probably die. The wounds of the seven others are expected to heal or be closed, though two have had complicated sinuses requiring revisions. The recent cases appear to be healing better with streptomycin and experience.

All patients had sputum conversion and absence of acid-fast bacilli in the sinus postoperatively. There were no secondary organisms present in the cavities at operation in those cases studied. Eighteen (70 per cent) of the 23 patients still have negative sputa, of the other five, one developed positive sputum after four years due to the appearance of a contralateral cavity; another after four years became positive following an exacerbation of tuberculous bronchiectasis; a third patient became positive in 18 months due to the appearance of a contralateral cavity, and another in 18 months due to an ipsilateral cavity. The other patient, after a year, became positive from an exacerbation of the original focus on which a plastic closure was done too early.

The recent cases are semi-ambulant. Of the other 17 patients, seven are working, two are ambulant, and one is semi-ambulant. Five are in bed and two are dead. The result has been good in eight of the patients operated on over two years ago; all of these have healed wounds, negative sputum, and are working or ambulant. In four patients the wound healing has been delayed, but will probably be good. These patients still have some sinus formation, but the sputum is negative with one exception. In this patient an exacerbation occurred in the sinus tract.

In two patients the results are uncertain. Both were working and the sputum was negative for four years in both instances before becoming positive again; this was due in one case to the appearance of a contralateral cavity, and in the other to an exacerbation of bronchiectasis. Both still have small unhealed granulomatous areas, but not sinus formation.

The result may be considered a failure in three cases. One improved and was negative for 18 months postoperatively; then developed a contralateral cavity and a general breakdown of the sinus. The situation was aggravated by a domestic situation. Death resulted in the other two patients. One died postoperatively following an attempt to drain a second later developed cavity by another surgeon. The cause of death was thought to be a pneumonia. The third died four years postoperatively of a tuberculous spine and cardiac insufficiency though the pulmonary lesions were controlled. The total mortality was thus 12 per cent for the 17 patients operated on between two and five years ago, or 9 per cent for the entire group. There were no direct operative deaths following operations performed by the writer. In at least 12 per cent of the patients the result is uncertain. The 12 good and probable good results would make a salvage of approximately 70 per cent. Six patients recently subjected to operation appear to be doing somewhat better than the previous ones, possibly due to increased experience and the aid of streptomycin.

Conclusions

Pneumonotomy with open drainage of an isolated tuberculous pulmonary cavity over 2 cm. in diameter may be of value in the following limited circumstances, particularly if hemorrhage or sepsis is present: After the maximum degree of collapse possible has been achieved; when further collapse is contraindicated; and where additional collapse or resection would result in the loss of function of an excessive amount of relatively good lung tissue. Other plumonary lesions should be under control or have good possibilities of same.

The procedure is well tolerated by such poor risk patients and the results are relatively satisfactory for such a group. It would appear that a complicating sinus which persists after nine months may be excised and the defect closed with reasonable expectancy of healing.

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A.C.H.A. NEWS

The American College Health Association (formerly the American Student Health Association) maintains its interest in bringing together both college and physician for the fulfillment of existing vacancies in Health Services. The following colleges have indicated a need for physicians:

Dr. Harold D. Cramer, Director of University Health Service, University of Idaho, Moscow, Idaho.

Dr. Malcolm Price, President, Iowa State Teachers College, Cedar Falls, Iowa.

Dr. K. D. McClelland, Acting President, Knox College, Galesburg, Illinois.

Dr. Roxie A. Weber, Assistant Director, Student Health Service, Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma.

The Association urges that any information concerning College Health Service vacancies or names of interested and qualified physicians be forwarded to the American College Health Association, Dr. Edith M. Lindsay, Secretary-Treasurer, School of Public Health, University of California, Berkeley 4, California.

FIRST ANNUAL A.A.G.P. ASSEMBLY

The first Annual Scientific Assembly of the American Academy of General Practice met in Cincinnati, Ohio, March 7, 8, and 9.

Over 2,500 physicians registered for the Academy which has as its immediate aim the expansion of facilities for postgraduate training in general practice and revision of the undergraduate curricula to insure medical graduates of an education which can meet the demands of modern day general practice.

Tuberculous Osteomyelitis of the First Rib Resulting in Brachial Plexus Compression

A Case Report

Ernest H. Winterhoff, M.D., and James D. Murphy, M.D.
Oteen, North Carolina

Tuberculous involvement of the ribs, sternum or clavicle occurs in about 7 per cent of cases of tuberculosis of the bone.[1] Involvement of the first rib is unusual but has been reported.[2] The following case is interesting in that a tuberculous osteomyelitis of the first rib was the underlying cause of a brachial plexus compression resulting in partial paralysis of the left arm.

Case Report

History: E. W., a 34-year-old negro war veteran, was admitted to this hospital October 23, 1947, by transfer from a nearby veterans' hospital where he had been under treatment for pulmonary tuberculosis. He gave a past history of pulmonary tuberculosis of about one year's duration. Treatment had consisted of bed rest and pneumoperitoneum. After an interval of six months, the collapse therapy was discontinued as ineffectual.

Early in June, 1947, and about five months before admission, an abscess developed in the anterior chest wall to the right of the sternum. This abscess was incised and drained about a month after onset. The pus was found to be positive on culture for Mycobacterium tuberculosis. The abscess gradually subsided but left a residual draining sinus. In September, 1947, an abscess developed in the lower lumbar region which gradually increased in size. This was treated by multiple aspirations and the pus removed was found to be positive on direct smear for Mycobacterium tuberculosis.

Three months before entry this patient began to complain of pain and spasm in his left shoulder and at the base of the neck on the left. He also noticed that his left shoulder was higher than the right and that his neck was thrust forward and to the right. The pain was aggravated on turning the head to the left. About one week after the onset of pain in neck and shoulder, the patient became aware of a sensation of "needle pricks" in the left deltoid region. By the following morning the paresthesia had extended downward along the inner aspect of the left arm to the lateral side of the elbow and persisted for three to four days. In the course of the next two weeks this paresthesia spread down the inner aspect of the left arm and into the fingers. About two weeks after the onset of these sensory changes he developed weakness, paralysis and atrophy of the left arm. The process was gradual, the patient first noting loss of abduction of the arm. Paralysis then extended down the arm, forearm, and finally into the hand and fingers. Treatment was symptomatic—vitamins, heat and massage to the affected arm and shoulder. No improvement was noted, however, and the cause of the paralysis remained obscure.

The remainder of the history is non-contributory.

On admission to this hospital the patient complained of the following symptoms: generalized weakness, a daily elevation of temperature, a loss of about 30 pounds in weight during the past year, pain in the left shoulder and left side of the neck, weakness and partial paralysis of the left arm.

Physical Examination: The patient was a poorly nourished colored male who appeared chronically ill. His temperature was 100° F., pulse 90, respirations 20. The blood pressure was 100 systolic, 70 diastolic in both arms. The abnormal posture of the patient with left shoulder held higher than the right and neck thrust forward and to the right was plainly visible (Fig. 1). There was depression of the supraclavicular area on the left.



Fig. 1.

Examination of the chest revealed a small persisting sinus 1.5 cm. in diameter which was draining a slight amount of pus. This sinus was situated in the fourth interspace just lateral to the right of the sternum. Pet-

cussion of the chest revealed impaired resonance over the left upper portion posteriorly. There were no other positive physical findings in the thorax.

Examination of the back showed a slight left dorsal scoliosis. In the lower lumbar region was a fluctuant swelling 14 cm. in diameter which was non-tender and not warm on palpation.

Except for the left arm, the extremities were not abnormal. The left arm, forearm, hand and shoulder showed marked wasting. The deltoid prominence was absent on the left as a result of the atrophy, which was most apparent in forearm and hand. The thumb was unopposed and there was marked thenar atrophy as seen in medial nerve lesions. The patient was unable to execute any of the finer movements of the hand. All motions of the left upper extremity except flexion of the forearm were impaired and a slight degree of supination of the forearm was produced by the biceps muscle. For all practical purposes the left arm was of no functional value. A muscle evaluation study by electrical stimulation was not done. Evaluation of the motions of the arm and shoulder was done by palpation of the muscles. All the muscle groups contracted voluntarily but were weak with the exception of the flexors of the forearm and the external rotators of the shoulder which showed apparently normal tone and function.

Neurologic examination was negative except for the left arm. The only positive motor findings were absent radial and triceps reflexes on the left. No pathologic reflexes were present. The biceps reflex on the left was equal to that on the right. No definite sensory changes could be elicited. There was no dilatation of the pupils of the eyes.

Laboratory Examinations: The routine urinalysis and serology were negative. The sputum was negative for acid-fast bacilli on concentration and culture. The differential blood count on admission showed a mild hypochromic anemia. A spinal fluid examination done at the other hospital shortly before the patient was transferred to Oteen was negative.

X-ray Examination: A roentgenogram of the chest on November 4, 1947, revealed a destructive lesion involving the first and second ribs on the left near their junction with the transverse process. The first rib appeared to be fracture (Fig. 2). A tentative diagnosis of tuberculous osteomyelitis of the first and second ribs was made. The eighth posterior rib on the right also appeared to be affected by an incipient tuberculous process. The parenchyma of both lungs showed a tuberculous process with cavitation in the left upper lobe. The trachea was slightly shifted to the left. The left shoulder was elevated and there was a slight left dorsal scoliosis. Roentgenograms of the spine were negative.

Hospital Course: The patient was admitted to a medical ward at this hospital on October 23, 1947. On November 4 he was transferred to the surgical service. On the following day the abscess in the lower lumbar area was incised and drained. A wide incision was made and the abscess cavity packed with dry sterile gauze. Dressings were done daily and the wound repacked with sterile



Fig. 2.

dry gauze. The abscess area closed rapidly and in three and one-half months healing was complete. No underlying bony pathology has been demonstrated to date.

The patient was started on streptomycin therapy November 12, 1947, for the draining chest wall sinus and the lumbar abscess. A dose of 0.5 gram was given at 9:00 A.M. and 0.5 gram at 9:00 P.M. and continued in daily doses until February 21, 1948. The sinus in the chest wall closed one month after the institution of the streptomycin therapy.

The chief concern of the patient was the uselessness of the left arm. This paralysis seemed to become more extensive and more marked after admission here, especially in the hand. The etiology of the paralysis was thought to be compression of the brachial plexus by the tuberculous process involving the first and second ribs on the left. Symptoms were not unlike those found in a posterior and medial cord compression of the brachial plexus. It was decided to perform a four-rib thoracoplasty on the left side in order to remove the diseased portions of the first and second ribs, and at the same time to give the patient a permanent collapse of the upper lobe in an attempt to close the left apical cavity.

After the patient had been on streptomycin therapy for 22 days, a first-stage, left posterolateral thoracoplasty was performed December 4, 1947, under cyclopropane-nitrous oxide-ether anesthesia. Through a classical incision the fourth and third ribs were disarticulated and removed subperiosteally from their attachment to the vertebrae posteriorly to the anterior axillary line. The second and first ribs were found to be the site of a destructive process which involved the posterior third of



Fig. 3.

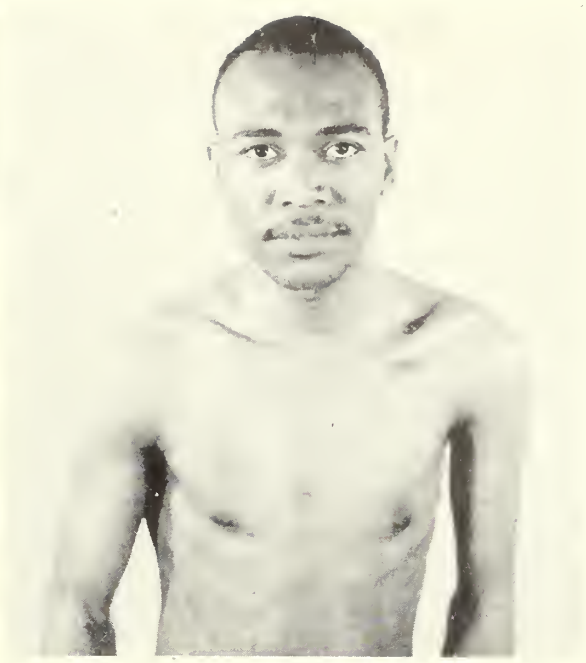


Fig. 4.

both ribs. There was a pathological fracture of the first rib just lateral to its junction with the transverse process. As a result of this fracture, the anterior three-fourths of the first ribs was displaced anteriorly and inferiorly. Surrounding the necrotic portion of the first rib was a small abscess just lateral to the first and second vertebrae which on evacuation yielded half an ounce of thick, greenish pus. The second rib just below the necrotic area showed the same typical moth-eaten appearance with a small caseating mass encircling it.

These two ribs were disarticulated subperiosteally at the transverse process and removed from their attachments anteriorly to the costochondral junction. The brachial plexus was not identified but the location of the first rib and the abscess surrounding it left no doubt as to the underlying etiology of the brachial compression. Two rubber tissue drains were placed in the first and second rib beds and brought out through the middle of the incision, which was then closed in layers with interrupted chromic sutures. The skin incision was closed with interrupted dermal sutures.

Pathologic examination of the rib fragments showed grossly the typical moth-eaten appearance of an osteolytic process. Microscopic examination of the necrotic bone tissue showed frayed cancelli. The encircling fibrous tissue contained many plasma cells and lymphocytes with ill-defined masses of epitheloid cells and Langhans giant cells. In many areas delicate acid-fast bacilli were seen. The microscopic diagnosis was tuberculosis of the rib.

The patient's postoperative course was uneventful. Sutures were removed on the seventh postoperative day. Removal of the drains was begun on the third day and completed on the fourth. In one month the incision had healed completely with no signs of a draining tuberculous sinus.

Two days following operation there was a dramatic beginning of return of function to the left arm. The patient was started on a course of physiotherapy. Function of the left arm improved steadily and at the present time (four months after surgery) function has returned to about normal. All muscles are active and exercises are now being directed toward increasing muscle tone. Streptomycin therapy was discontinued February 21, 1948, and throughout the course no toxic reactions were noted. The patient has regained his lost weight and the pulmonary lesions show definite signs of clearing (Figs. 3 and 4).

Comment

Brachial plexus compression by a tuberculous bone lesion is of rare occurrence and the case reported above is the first in this category to be recorded at this hospital. Clinical symptoms indicated that the posterior and medial cords of the plexus were compressed. Paralysis was not complete and no sensory changes were apparent while the patient was under our care. In compression-type injuries of the brachial plexus we do not always find the sensory changes seen in those cases in which there has been complete severance of the plexus. In our patient the muscles affected were those served by the axillary, medial, radial and ulnar nerves.

We are of the opinion that four factors contributed to bring about paralysis in this case: (1) elevation of the left shoulder; (2) spasm of the muscles of the neck and shoulder produced by the abscess; (3) thrusting of the neck forward and to the right; and (4) the patho-

logical fracture with anterior displacement of the first rib.

This case represents the value of streptomycin as an adjunct in the treatment of tuberculous abscesses. Our experience before the advent of streptomycin in the treatment of these abscesses was most discouraging. Several years before the appearance of this antibiotic, the thoracoplasty performed in this case would have entailed several possible complications. The most common would have been the development of a large tuberculous abscess undermining the scapula with sinus formation. Another distinct possibility would have been a hematogenous spread of the disease.

Since the introduction of the use of streptomycin in the treatment of tuberculosis we have become increasingly bolder in our handling of abscesses of tuberculous origin. We believe that if a tuberculous abscess can be adequately drained and the abscess cavity kept open to the outside, it will close in the vast majority of cases in from one to four months. Streptomycin therapy combined with surgery promises the patient a cure of the abscess provided the tuberculous organism is sensitive to streptomycin.[3]

SUMMARY

A case of brachial plexus compression with resulting partial paralysis has been presented. The underlying cause of the compression was a tuberculous osteomyelitis of the first and second ribs. The case was successfully treated by surgery and streptomycin therapy.

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From the Department of Medicine and Surgery, Veterans Administration, Oteen, North Carolina; published with permission of the Chief Medical Officer, Department of Medicine and Surgery, Veterans Administration, who assumes no responsibility for the opinions expressed or conclusions drawn by the authors.

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Official Journal of the American College Health Association, Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology

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Editorial

SPONTANEOUS PNEUMOTHORAX

The initial symptoms of spontaneous pneumothorax may closely simulate those of acute disturbance of coronary circulation. Sudden excruciating pain, often precordial, with shock has frequently caused physicians to make a presumptive diagnosis of coronary disease. If the pneumothorax is small, it may not be found by the conventional physical examination. In most cases x-ray film inspection and, in many, fluoroscopy reveals the condition. Severe pain may persist for a few minutes to an hour or so, after which it gradually subsides and usually has disappeared within 24 hours or less. Shortness of breath is a common symptom soon after the pain appears, but breathing is presently restored to normal unless extensive collapse of the lung occurs as the result of positive intrapleural pressure. The onset of spontaneous pneumothorax is not necessarily associated with strenuous exertion. Individuals have been awakened from sound sleep by the initial pain. Others have had the first symptoms appear while reading in bed. From these relatively inactive states cases have been reported which developed through all degrees of activity to the most strenuous physical exertion.

This condition occurs in all ages of life, from infancy through senility. It has been reported as an accompaniment of many pulmonary diseases, such as malignancy, tuberculosis, silicosis and even chronic fibrosis of undetermined etiology. In such cases, if the underlying disease has not previously been known, it can usually be found soon after the attack or when the lung expands.

Spontaneous pneumothorax has frequently been seen when no evidence of disease could be found after expansion of the lung. Such cases were long classified as idiopathic. However, it has been learned that a frequent cause is small vesicles or blebs immediately subjacent to the visceral pleura which rupture into the pleural space. Such blebs may represent localized areas of emphysema or congenital weaknesses in the pleura. The resulting collapse, Kjergaard designated as pneumothorax simplex. In 1934 we reported 31 cases of spontaneous pneumothorax, of which 19 failed to show any evidence of pulmonary disease. We have since seen many more of the same type. Large numbers of such cases have been reported by other authors.

Simple spontaneous pneumothorax has been most often observed in young adult males. Indeed, it created a significant problem during World War II in the military services; so much so that the National Research Council issued a special pamphlet prepared by J. J. Waring of Denver, on the diagnosis and management

of spontaneous pneumothorax. This was made available to our medical officers everywhere.

In the majority of cases the lung only partially collapses. The symptoms promptly subside and expansion occurs within a few days to a few weeks. It is remarkable in how few cases significant amounts of fluid accumulate in the pleural cavity except when hemo-pneumothorax results from bleeding at the point of pleural rupture.

Occasionally when the pleural break occurs, a flap-like opening is created which acts as a one-way check valve. Thus air enters the pleural space on inspiration, but closure of the valve prevents its escape on expiration with the development of high positive pressure in the pleural cavity. This situation immediately becomes an emergency as pressure results in marked mediastinal displacement with severe embarrassment of respiratory and cardiac function. If the condition is not recognized death can result in a short time. Such deaths have been reported as due to coronary disease.

If the condition is recognized in time, prompt relief is observed by thrusting an 18-gauge needle through the chest wall. Enough air escapes to remarkably reduce the pressure in a few seconds. It may then be necessary to pump air from the pleural cavity but high negative intrapleural pressure should be avoided. Every physician should carry a two-way air pump, rubber tubing and needles in order to cope with this emergency should it occur in his practice. In some cases, after the needle is removed air accumulates so fast and aspirations are required so frequently that an indwelling needle or catheter and check valve are advantageous to provide continuous escape of air from the pleural cavity until air no longer accumulates through the pleural opening to cause positive pressure.

In cases of spontaneous pneumothorax resulting in partial collapse of a lung, emergencies may be created by ascent to an altitude of 5000 feet or more as in airplane travel. This was observed in World War II when evacuating by airplane cases of pneumothorax from any cause. The volume of air in the pleural space increases with altitude. At 18,000 feet it is doubled and at 34,000 feet, quadrupled. Three thousand cubic centimeters of air in the pleural cavity at sea level assumes the volume of 3720 cc. a mile above. Therefore, a person with pneumothorax may be in distress at an altitude of one mile and his life jeopardized at higher altitudes.

Two or three decades ago it was recommended that every person with simple uncomplicated pneumothorax be placed on strict bed rest for at least one year because it was thought tuberculous lesions were the underlying cause, although they could not be demonstrated. In a sizable group of cases (soon to be reported), we have seen only one who subsequently developed clinical tuberculosis. Spontaneous pneumothorax occurred in 1923 and pulmonary tuberculosis was not in evidence until 1928. Experience has shown that in the vast majority of cases of simple spontaneous pneumothorax no treatment is required except sedation for pain at the beginning and a few days of bed rest. The pleural rent soon closes and the lung expands without incident. However, the condition may recur once or many times, occasionally bilaterally. If recurrences become too frequent, an attempt may be made to adhere the visceral and parietal layers of pleura by introducing into the pleural space when the lung is practically expanded, 25 to 50 cc. of a mildly irritating substance, such as hypertonic glucose solution (30 to 60 per cent) lipiodol or mineral oil.

J. A. M.

News Items

North Dakota

Committee appointments for the Cass County Medical Society were announced by Dr. Charles Heilman, Fargo, elected president at the recent annual meeting. Dr. Earl Haugrud is vice president and Dr. John H. Bond, secretary-treasurer. Both are from Fargo.

On the board of censors are Drs. B. A. Mazur and William C. Nichols, both Fargo, and S. C. Bacheller, Enderlin.

Dr. Robert Rogers, Fargo, is program chairman, with Drs. Allen Moe and Coy Kaylor, both Fargo, on the committee.

Others include public health and public relations, Drs. G. A. Dodds, chairman, Mazur and F. A. deCesare, all Fargo; cancer, Drs. John LeMar, R. D. Weible and A. C. Burt, all Fargo; medical economics, Drs. E. H. Richter, Hunter, chairman, A. L. Klein and Joseph Schneider, Fargo; national and state medical legislation and information, Drs. O. A. Sedlak, A. C. Fortney and W. E. G. Lancaster, all Fargo.

Dr. W. C. Vogelwede of Carrington was elected president of the Tri-County Medical Society.

Other officers include Dr. P. A. Boyum, Harvey, vice president; Dr. D. W. Matthai, Fessenden, secretary-treasurer; Dr. R. F. Gilliland, Carrington, delegate; Dr. C. G. Owens, New Rockford, alternate delegate, and Dr. E. J. Schwinghammer, New Rockford, councillor.

Dr. Nelson A. Youngs was elected president of the Grand Forks District Medical Society at the monthly meeting in January. Dr. Ralph E. Mahowald was named vice president and Dr. L. B. Silverman was re-elected secretary-treasurer.

Five Grand Forks men recently attended a meeting of the North Dakota Medical Center advisory council in Bismarck. They were Prof. John A. Page, council chairman, and Dr. R. E. Leigh, Harry D. Keller, W. F. Potter and J. Lloyd Stone, advisory members. The committee will study recommendations growing out of the passage of the one-mill tax levy for a medical center in the November election.

Three physicians have been added to the staff of the De-Puy-Sorkness clinic. They are Dr. Robert E. Lucy, obstetrics; Dr. Robert Lee McFadden, eye, ear, nose and

throat; and Dr. James V. Miles, Jr. Dr. Miles is a staff member of Trinity hospital and is secretary of the staff at Jamestown hospital.

The Grand Forks Clinic announces the addition of Dr. Robert C. Turner to the clinic staff. Dr. Turner's practice is limited to internal medicine.

Dr. E. G. Vinje, Hazen physician for the past three years, has taken Dr. Walter R. Enders into partnership in medical practice.

Dr. Enders came here last August to assist Dr. Vinje, following completion of his internship at Ancker hospital in St. Paul.

The two recently moved their offices into a new clinic building, which was completed in December.

Dr. Louis F. Pine of Worcester, Mass., a graduate of the University of Vermont, has become a member of the staff of the Lake Region Clinic, specializing in genito-urinary diseases.

Dr. Pine is the fourth member of the clinic staff. Other members of the clinic are Drs. John, Donald and Robert Fawcett.

Dr. R. J. Carlson, formerly of New England, has made arrangements to locate in Watford City and will have his office in the Stenslie building formerly occupied by Dr. A. G. Skjelset.

Dr. Carlson received his medical degree from the University of Iowa in 1933, and served his internship in Covenant Hospital, Omaha. He received his North Dakota license last July.

Dr. G. A. Stokes, 70, who has just completed 25 years of service in Streeter, was honored by the people of the community for his fine work.

The physician, who has been considering retirement, told the assemblage "after this party I should be good for another 25 years."

Added to the staff of Fargo Veterans Hospital is Dr. John S. McNeil, native of Little Rock, Ark., and formerly in private practice at Albion, Nebr. Dr. McNeil, who came to Fargo in February, is examiner with the outpatient and reception service. A graduate of University of Arkansas, he served as interne at Lincoln, Nebr., and was 3½ years in the army medical corps in World War II.

Dr. A. K. Johnson was elected president of the Kotana Medical Society at its annual business meeting in Williston in February.

Dr. I. S. AbPlanalp, the retiring president, presided at the meeting, at which medical topics of current interest were discussed.

Other officers elected were Dr. J. P. Craven, vice president, and Dr. E. J. Hagen, secretary-treasurer.

South Dakota

Dr. J. L. Stewart of Spearfish, retired medical practitioner and former member of the Homestake medical staff, received special recognition at a meeting of the Black Hills District meeting in February. He was presented with an honorary pin from the State Medical Society in recognition of 50 years of active medical practice in South Dakota.

Names of 14 physicians admitted to practice in South Dakota through reciprocity were announced by Dr. G. J. Van Heuvelan, superintendent of the state board of health. The physicians and the cities at which they are entering practice include:

James N. Berbos, Aberdeen; David Scott Berkman, Rapid City; Thomas Edward Eyres, teaching at the State University; Donald Nels Fedt, Watertown; Robert W. Huber, Watertown; H. E. Kicenski, McIntosh; Irvin I. Kaufman, Freeman; Arthur Walter Kilness, Sioux Falls; Richard Harmon Lindquist, Canova; Luther Arnold Nelson, Faulkton; Edwin Takayasu Nichimura, Midland; Norris S. Rothnem, Sioux Falls; Marion A. Warpinski, McLaughlin, and Rudolph J. Wieseler, Sioux Falls.

Dr. W. A. George, Selby, South Dakota, pioneer physician, was honored in January on his 75th birthday and in recognition of his 43 years of service in the Selby community.

Dr. H. M. Hardwicke, medical director of the Co-operative Health Federation of America, gave the principal address at the annual meeting of the Rosebud Community Hospital in Winner on February 26.

A powerful and intensive speaker, Dr. Hardwicke stressed what members should know about their clinic-to-be. He assisted in selection of the medical staff of Group Health Co-operative of Puget Sound, a 22-physician Seattle clinic, and is now engaged in assisting in the selection of a staff for the Rosebud Community hospital.

Thomas B. Schultz, administrative officer, division of hospital facilities, South Dakota state board of health, who is in charge of the federal hospital construction program in this state, presented a large check, the first Federal payment to the hospital, at the meeting. This was the first payment, under the federal one-third matching funds plan, to be made in South Dakota.

An address by Dr. R. Perry Elrod, professor of Microbiology at the University of South Dakota, and a smoker as guests of the Sioux Falls District Medical Society opened the 53rd annual meeting for members of the Sioux Valley Medical Association in January.

Speakers here for the convention besides Dr. Elrod were Dr. E. G. Holmstrom, Salt Lake City, Utah; Dr. James W. Martin, Omaha, Nebr.; Drs. R. A. Bieter, Paul Dwan and Clarence Dennis, all of Minneapolis; Drs. C. F. Lake and Walter F. Kvale, Rochester, Minn., and W. O. Samuelson, Omaha, Nebr., who was the guest speaker at the annual banquet.

Minnesota

Dr. George E. Moore, clinical instructor in surgery at the University of Minnesota, is one of 13 United States doctors chosen to receive five-year, $25,000 medical scholarship grants for their work in medicine.

The grants, from the John and Mary R. Markle Foundation, New York, are intended to keep young doctors on the teaching and research staffs of the country's medical schools. Dr. Moore, a graduate of West high school and University of Minnesota, has worked with radio-active materials in the early detection of cancer.

A young University of Minnesota biologist who specializes in cancer research was named the outstanding young man of Minneapolis in 1948 by the Minneapolis Chamber of Commerce.

Dr. Robert A. Huseby, assistant professor, was given the award at the annual Minneapolis Jaycee "Bosses' Night" dinner.

Dr. Huseby has engaged in cancer investigation since 1941. Last year he was awarded the William A. O'Brien assistant professorship in cancer research. He is a native of Minneapolis.

Dr. John A. Anderson, formerly of the University of Minnesota, will become head of Stanford University pediatrics department September 1.

Dr. Anderson has been chairman of the pediatrics department at the University of Utah. He is a graduate of the University of Minnesota.

From 1937 to 1943 he was on the faculty of the University of Minnesota medical school.

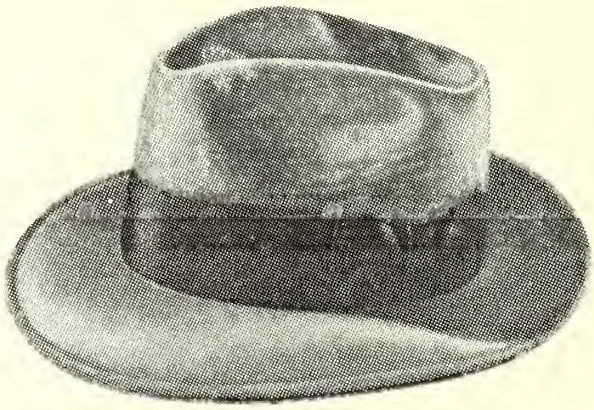
Dr. Corwin Hinshaw, a member of the Mayo Clinic staff since 1933, said at Rochester, Minn., he will leave April 1 to become clinical professor of medicine at Stanford University, Palo Alto, California.

Dr. Robert F. McGandy was elected president of the Hennepin County Medical Society in February.

He will be installed to succeed Dr. Edward Dyer Anderson the first Monday in October.

Other officers elected, who will be installed at the same time, are: First vice president, Dr. John H. Moe; second vice president, Dr. Ernest R. Anderson; board of directors, Dr. L. Haynes Fowler and Dr. Horatio B. Sweetser, Jr.; board of censors, Dr. Thomas J. Kinsella and Dr. Donald McCarthy; board of ethics, Dr. Malcolm B. Hanson and Dr. Robert L. Wilder; board of trustees, Dr. Arthur C. Kerkhoff and Dr. Malcolm C. Pfunder; delegates to Minnesota State Medical Association, Dr. James K. Anderson, Dr. Lawrence R. Boies, Dr. Ralph H. Creighton and Dr. Willard D. White.

Dr. Robert Semsch was named county physician by the county board today, replacing Dr. Charlotte Morrison, whose term expired January 1.

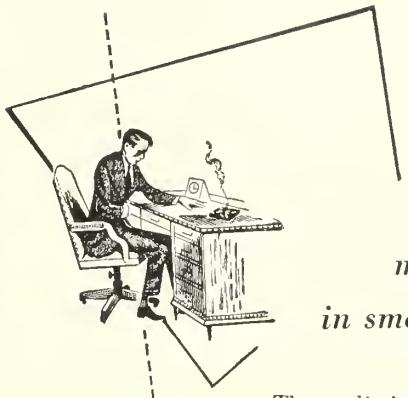


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Obituaries

Dr. B. O. Mork, Sr., 82, Worthington, Minnesota, dean of the southwestern Minnesota medical profession and one of the founders of the Worthington Clinic, died March 2nd in the Tenth Street Hospital, where for more than 30 years he had brought thousands of others back to health and strength. Dr. Mork, who on December 21 announced his intention of retiring January 1 from the active practice of medicine, had little time to enjoy his freedom from care. Byron Olaf Mork was born in Hjorundford, near Aalesund, Norway, March 28, 1867.

Dr. Frederick Arthur Drakem, 78, Lanesboro, Minnesota, pioneer physician and surgeon and civic leader of this community, died in the Lanesboro Hospital January 31st. He had been a patient for one year and nine months in the hospital and ill for five years. Dr. Drake came to Lanesboro to practice 51 years ago and immediately threw himself into the life of the community in a manner which made him an important civic figure as well as a physician loved by the entire community. Dr. Drake was born July 8, 1870, in Rushford, Minn.

Dr. Gilbert Cottam, 75, former Minneapolis doctor and leader in Minnesota and South Dakota medicine, died March 4th, in Pierre, South Dakota. A well-known surgeon and medical spokesman, Dr. Cottam left Minneapolis in 1940 to practice in Sioux Falls, South Dakota. He became superintendent of the South Dakota state board of health, at Pierre in 1943. Dr. Cottam was born in Manchester, England, and came to the United States at 16. He was graduated from St. Louis, Mo., University, in 1893, practiced at Rock Rapids, Iowa, until 1910; at Sioux Falls until 1930, and then for ten years in Minneapolis.

Dr. Angus W. Morrison, prominent in Minneapolis medical and civic affairs for 35 years, died January 28th at Eitel Hospital. He was 65 years old. Dr. Morrison was a member of a pioneer Minneapolis family. Dr. Morrison was born in Minneapolis July 18, 1883, the son of Clinton and Julia Washburn Morrison. He lived his entire life in the Twin Cities area. His home was at Maplewoods, Wayzata.

Dr. Roy G. Spurbeck, 59, widely known Cloquet physician, died at his home at 629 Chestnut Street, shortly before midnight, February 12th. He had been in ill health for a number of years. Born in Mantorville, Minn., Dr. Spurbeck moved with his parents to Two Harbors as a boy, residing there several years. He was a graduate of Northwestern University Medical School. He practiced medicine at Proctor for a couple of years and in 1917 came to Cloquet, continuing until poor health forced his retirement.

Dr. Edwin H. Maercklein, 68, for 45 years a physician in Ashley, North Dakota, died March 7th in Veterans Hospital, Minneapolis.

The JOURNAL LANCET

Minneapolis, Minnesota
May, 1949

Vol. LXIX, No. 5
New Series

Poisoning in Children

Newer Methods of Treatment

Wallace W. Lueck, M.D.*
Minneapolis, Minnesota

Approximately 500 children in the United States die from poisoning each year. Poisoning ranks third as a cause of accidental death in the home when all ages are considered and is exceeded only by deaths from falls and burns. About one-third of all poisonings occur in children under 5 years. In the pediatric age group about 90 per cent are below this age.[1] It is estimated that 1 per cent of pediatric hospital admissions are for poisoning.

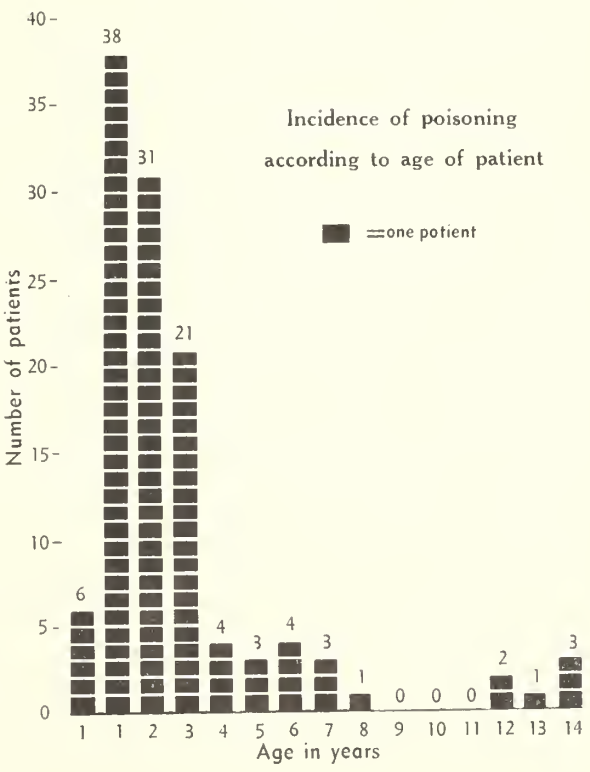
Hundreds of agents have been known to cause acute poisoning, and strychnine is usually listed as the commonest agent causing death with methyl salicylate ranking second. In the South and in rural areas, lye and kerosene tend to be the most frequent type of poisoning.

Clinical Analysis

From 1940 to the middle of 1948, 117 patients in the pediatric age group (birth to 15 years) were hospitalized at the Minneapolis General Hospital for acute poisoning. This number does not include those admitted for food poisoning. Six deaths occurred in the group. Two girls were attempted suicides at age 13 and 14 years. There were 73 males and 44 females. The number of patients according to age groups is shown in Table 1. The largest single age group was age 1 to 2 years and 82 per cent were 3 years old or younger.

Over 50 different agents were incriminated and the commonest group of poisons was listed as insecticides or rodenticides. Twenty patients were in this group and ingested such things as lead arsenate, lead arsenite, sodium fluoride, sodium arsenite, red squill, thallium sulfate, DDT, and phosphorus. Kerosene was the com-

Table 1



*From the Minneapolis General Hospital and Department of Pediatrics, University of Minnesota Medical School, Minneapolis, Minnesota.

monest single agent and 15 patients were in this group. Twelve patients ingested liniments, the majority of which contained methyl salicylate. Of the remaining patients there were 11 who took barbiturates; 6 swallowed lye; 4 turpentine, alcohol, furniture polish, iodine and "Ex-Lax." Other poisons included aspirin, boric acid, lead, opium, lysol, atropine, hilex, moth balls, etc.

These children obtained their poisons by almost every method. One very common source was the ingestion of poisons stored in soft-drink bottles. Many of the insect and rodent poisons were mistaken for food and were even cooked and served as cereal by well-meaning parents. Exploration of the medicine cabinet or of a mother's purse was another common source. Boric acid solution and an increasingly more common agent, potassium bromate, present in home permanent hair waving sets, were inadvertently mixed with infant's formula.

The difficulties encountered in diagnosing certain cases of poisoning are exemplified by the case of a 14-year-old boy brought to the hospital in coma. He was transferred to another hospital after four hours of observation where bilateral trephinations were performed on suspicion of subdural hematoma. Three days later the patient recovered consciousness and gave a history of ingesting barbiturates. Poisoning should be suspected in every patient presenting unusual symptoms.

The six deaths in this group were all due to different agents. A 19-month-old infant expired four hours after ingesting an ant poison containing arsenic compounds. A 22-day-old infant died as a result of two 6-minim doses of tincture of opium substituted for camphorated tincture of opium. The remaining four deaths were in children 2 years of age. One died as a result of ingesting barium sulfide which is a constituent of a commercial hair remover, one from ingesting "Drano" which contains sodium hydroxide, one from drinking methyl salicylate and one as a result of boric acid poisoning following the use of boric acid packs for eczema.

DISCUSSION

Only a brief resumé of some of the common and more recently emphasized poisons and the procedures for the treatment of these will be presented.

DDT

The recent wide-spread use of DDT as an insecticide makes it a potential source for frequent poisoning in children. Death has been reported in a 19-month-old infant following ingestion of 150 mg. of DDT in kerosene per kilogram of body weight.[2]

DDT is relatively insoluble in water and in the powder form the particles presumably are too large for much absorption by inhalation. DDT, however, may be readily absorbed when present in an organic solvent and toxic effects have been reported from ingestion, inhalation and contact.

Symptoms of acute poisoning from DDT include nauesa, vomiting, hematemesis, melena, anuria, transitory "yellow vision," instability, extreme excitability, tremors, twitching, muscular weakness, feeling of tiredness, aches in muscles, joint pain, spasms of extreme nervous tension, sleeplessness, anxiety, convulsions, coma and death.[2,3,4]

Recommendations for therapy of the toxic effects are based largely on experimental evidence.[5] Experimentally, Urethane gave the best results for control of the neurological symptoms with sodium diphenyl hydantoinate (Dilantin) the next most effective drug. Diets high in protein contributed slightly to a decrease in toxicity to the liver and to a decrease in the mortality. Choline produced return of function of the vagus. Calcium gluconate intravenously is reported to be of value. Since DDT is excreted by the kidney, diuresis produced by forced fluids is recommended.

BAL

The discovery of BAL (British Anti-Lewisite; 2,3 dimercaptopropanol) resulted in an effective agent for the treatment of poisoning due to certain heavy metals. BAL is a compound containing two sulfhydryl (–SH) groups. A number of body proteins and enzymes contain sulfhydryl groups and it is believed that certain metal ions produce their toxic effects by combining with these sulfhydryl groups, thereby inhibiting important enzyme systems. The BAL sulfhydryl groups compete successfully with the body protein and enzymes, thereby "detoxifying" the metal ions.

Randall and Seeler [6] have recently reviewed much of the literature on BAL including its apparent effects on human and experimental poisonings due to arsenic, mercury, gold, lead, cadmium, silver, antimony, tellurium, copper, bismuth, chromium, nickel, zinc, thallium, selenium, vanadium, alloxan and phenylthiourea. They summarize by saying, "BAL has been shown to be of clinical value in the treatment of arsenic, mercury and gold poisonings. Further clinical studies are necessary before the efficacy of BAL in other metal poisonings can be evaluated. Studies on animals suggest that BAL actually enhances the toxicity of certain metals. Therefore, BAL should not be used indiscriminately in the treatment of metal poisonings." It is also reported to be of value in acrodynia.[7,8]

BAL is supplied commercially as a 10 per cent solution with Benzyl Benzoate 20 per cent in peanut oil for intramuscular administration. Specific dosage schedules for heavy metal poisonings are still not absolute. Woody and Kometani [9] treated 42 infants and children with BAL for arsenic poisoning. They gave 2.5 mg. of BAL per kilogram of body weight every four to eight hours for three to six doses to children treated on suspicion of arsenic ingestion but having no symptoms. Children with mild symptoms received 2.5 to 3.5 mg. per kilogram every four to eight hours for six to twelve doses and those with severe symptoms received 3.5 mg. to 5.0 mg. per kilogram every four to eight hours for six to twelve doses. In addition they used general and supportive measures as indicated.

Toxic symptoms from BAL reported by them include anorexia, restlessness, vomiting, pain at injection site, salivation, hypertension, fever, tachycardia, convulsions, "Leukotoxic effect," and reducing substance in the urine. Reactions were related to the size of individual doses and also to the cumulative amount of BAL given. Re-

actions were also more frequent when treatment was given on "suspicion" of arsenic poisoning.

Tye and Siegel [10] report that relief of toxic symptoms in adults was accomplished by 0.6 cc. of a 1:1000 solution of epinephrine hydrochloride given intramuscularly. They could prevent the development of toxic symptoms by giving 25 to 50 mg. of ephedrine sulfate a half hour before administration of BAL.

Methemoglobin Producing Agents

Reports continue to be published on poisoning from methemoglobin producing agents. The mechanism, etiology and treatment of methemoglobinemia and sulfhemoglobinemia have recently been reviewed by Finch.[11] In methemoglobin the iron has been oxidized from the ferrous to the ferric form. The change is easily reversible and in itself is not accompanied by any red-cell damage. Methemoglobin is unable to transport oxygen and therefore should be regarded as a temporarily inert pigment. Symptoms of methemoglobinemia appear at concentrations of about 20 per cent and death in dogs occurs at levels of about 85 to 90 per cent. The exact level at which coma and death supervene in man is not known.

Under ordinary circumstances the red cell energetically reduces methemoglobin by an enzymatic process in which glucose and lactate are the principal substrates. Clinical states of methemoglobinemia can be caused either by dysfunction of this reconversion mechanism or by the action of oxidants which produce methemoglobin more rapidly than the cell mechanism is able to reduce it. Substances reported by Finch which act as oxidants producing secondary methemoglobinemia are shown in Table 2. Pediatric sources for these compounds include laundry ink on diapers, color crayons, and contaminated well-water used in preparing the formula.

Table 2

Amino and nitro compounds producing methemoglobinemia.

Aromatic Drugs:	Aliphatic and Inorganic Drugs:
Aniline	Sodium nitrite
Anilinoethanol	Hydroxylamine
Phenacetin	Dimethylamine
Acetanilid	Nitroglycerin
Methylacetanilide	Amyl nitrite
Hydroxylacetanilide	Ethyl nitrite
Prontosil	Bismuth subnitrate
Sulfanilamide	Ammonium nitrate
Sulfapyridine	
Sulfathiazole	
Phenylenediamine	
Aminophenol	
Toluenediamine	
Alphanaphylamine	
Paraminopropiophenone	
Phenylhydroxylamine	
Tolylhydroxylamine	
Nitrobenzene	
Dinitrobenzene	
Trinitrotoluene	
Nitrosobenzene	
Paranitraniline	

By French.

In the treatment of methemoglobinemia, three mechanisms may be employed, namely, reconversion to hemoglobin by reducing substances, the normal cell reconversion mechanism or the catalysis of this normal process.

Ascorbic acid and glutathione are effective as reducing agents although ascorbic acid only has been used clinically. It is effective in the therapy of the primary or congenital type of methemoglobinemia in dosage of 100 to 500 mg. a day. The action of ascorbic acid is relatively slow.

Methylene blue acts faster and is the drug of choice for treatment of secondary methemoglobinemia. It brings about reversion of methemoglobin not by its own reduction capacity but through acceleration of the normal cell reconversion mechanism. It is given in dosage of 1 mg. methylene blue (as 1 per cent sterile solution) per kilogram of body weight in adults and 2 mg. per kilogram in infants. It is injected intravenously slowly over a period of five minutes. If cyanosis has not disappeared within an hour, a second dose of 2 mg. per kilogram may be given again. Methylene blue may be given orally in doses of 3 to 10 mg. per kilogram.

Methemoglobin itself is useful in combating cyanide poisoning. Cyanide produces paralysis of tissue respiration by combining with cytochromes. The toxicity of cyanides is reduced by combination with methemoglobin which is produced therapeutically. The cyanide has a greater affinity for the methemoglobin than for the other tissues. The usual therapeutic regime consists of 0.5 gram of sodium nitrite intravenously over 5 to 10 minutes to produce methemoglobin. Inhalation of amyl nitrite is even more rapid and is used while waiting for the preparation of the intravenous medication. Sodium thiosulfate is also given intravenously in dosage of 10 to 25 grams as 25 per cent solution. This combines with the cyanide to form thiocyanate, which is relatively non-toxic and is excreted.

Salicylates

All the salicylates except phenyl salicylate cause the same type of intoxication. Doses as small as 4 cc. of methyl salicylate (oil of wintergreen) have been fatal and the increased toxicity of this substance is attributed to its relative retention in the body. A fatality has been reported from skin absorption of salicylic acid ointment.[12]

Symptoms of salicylism include hyperpnea, apathy and lassitude, anorexia, tinnitus, convulsions, thirst, sweating, hyperpyrexia, abdominal pain, pallor and cyanosis, epistaxis and hemorrhagic phenomena, dehydration, difficulty in hearing, dimness of vision, mental confusion, nausea, vomiting, diarrhea, skin lesions of many varieties and death. Death usually results from respiratory failure after a period of unconsciousness.[13,14]

Laboratory findings include increased prothrombin and coagulation time and an elevated blood chloride level; reduction of copper by salicylate in urine; positive Gerhard's test, acetone, diacetic acid, albumin, casts white and red cells in the urine; salicylate blood levels over

32 mg. and commonly over 40 mg. per cent. The pH of the blood is initially elevated, later the pH may be reduced and the carbon dioxide combining power is normal or decreased.

The mechanism of salicylate intoxication in cases other than drug idiosyncrasy is generally explained on the basis of hyperventilation or hyperpnea due to a direct stimulation of the respiratory center by the salicylate. Carbon dioxide is blown off, causing a loss of blood CO_2, a decrease in bicarbonate and a transient predominance of base. This results in alkalosis with a high pH value early. Later there is some compensation by increase in serum chlorides and by gradual loss of base in the urine so that an acidosis develops. High salicylate levels are also supposed to increase muscle lactate and acid metabolites contributing to acidosis.[15]

The treatment of acute intoxication in addition to removing the unabsorbed salicylate by lavage and other symptomatic therapy is aimed at correction of acid-base balance. Obviously the best guide for therapy is close observation of the pH and treatment with appropriate electrolytes which by the time most patients are seen is usually sodium lactate or sodium bicarbonate. If the pH is not available the recommended therapy is adequate amounts of 5 per cent glucose and normal saline. Since much of the salicylate is excreted in the urine, treatment is directed at increasing the urinary output.

Deficiencies of glycogen and thiamine are reported to increase the sensitivity to intoxication, therefore glucose and thiamine are probably indicated. Vitamin K is in order for the correction of the hypoprothrombinemia. Hemorrhagic tendencies are further combated by small repeated whole-blood transfusions and vitamin C. Morphine and barbiturates have been used to slow the respiratory rate and thus diminish loss of CO_2 from the lungs.

Lye

The treatment of acute lye poisoning in children is discussed in a recent report from Duke University.[16] The essential points of the treatment are as follows: "Immediately after the ingestion of the alkali, an attempt should be made to neutralize the corrosive substance with a weak acid, such as diluted vinegar, lemon juice or orange juice. Removal of the caustic from the stomach by lavage is probably needless because of the neutralization of the alkali by gastric hydrochloric acid, while the resulting trauma may be harmful. Visible burns should be treated with an emollient such as olive oil, and the patient given a sedative to relieve pain. Liquids and soft foods may be given as tolerated. By the fourth day a soft rubber, eyeless catheter filled with mercury or small lead shot should be passed without force into the stomach and allowed to remain in place for 2 minutes. This procedure should be carried out for every patient, unless the esophagus is seen by direct illumination to be undamaged. In instances in which there is doubt, oral burns from caustic should be considered presumptive evidence of esophageal burns and sufficient indication for early esophageal dilations. The dilations are repeated daily, with a gradual increase in the size of the catheter and the period of dilation, until by the tenth day a No. 30 to 34 French catheter is kept down for five minutes. After daily dilations for two weeks, the number of them is gradually decreased to three a week for two weeks, two a week for one month, one a week for one month, two a month for three months, and one a month for six months and two or three a year for several years. If increasing difficulty is encountered during the course of treatment, daily dilations are again performed. Also, fluoroscopic examination with barium sulfate or an esophagoscopic study is advisable if difficulty is encountered." Emetics are contra-indicated.[17]

Kerosene

Steiner [18] has reviewed some of the literature on kerosene poisoning and reports 35 cases in children. He divided his cases into three groups on the basis of severity and complications: (1) acute toxicity and depression of the central nervous system with minimal pulmonary changes and with rapid recovery; (2) severe pneumonia, hyperpyrexia and prolonged recovery; and (3) severe pneumonia with evidence of degenerative changes in the myocardium, the liver, the kidney and the gastro-intestinal tract.

Treatment consisted of carefully performed gastric lavage with copious amount of weak sodium bicarbonate solution for the removal of the kerosene and the prevention of further absorption and damage to the gastro-intestinal mucosa. Nikethamide and/or caffeine were used as stimulants. Penicillin was instituted early to prevent bacterial pneumonia and hypertonic (50 per cent) dextrose solution with oxygen seemed helpful in diminishing early pulmonary edema. Adequate fluids, blood transfusions and digitalis were also used when indicated. Emetics are contra-indicated.[17]

General Considerations

Arena summarizes the handling of emergencies due to poisoning under seven steps.[17]

1. Identify the poison as soon as possible so that specific measure may be promptly instituted.
2. Evacuation: Remove the bulk of the poison from the stomach by
   a. Gastric lavage.
   b. emetic. Emetics are contra-indicated in kerosene and caustic alkali or if the patient is semi-comatose.
3. Antidoting the residual poison not removed by gastric lavage.
4. Antagonist when available.
5. Elimination from the system of the poison that has been absorbed.
6. Symptomatic treatment as indicated.
7. When the nature of the poison is unknown give the following universal antidote:
   Pulverized charcoal (burnt toast) 2 parts
   Tannic acid (strong tea) 1 part
   Magnesium oxide (milk of magnesia) 1 part.

I should like to emphasize the importance of the proper performance of gastric lavage. Kantor [19] and Moller [20] who systematically studied the problem, found

that with the use of relatively large amounts of fluid for each washing, lavage frequently was ineffective and resulted in the recovery of only a small amount of poison. Also, lavage promoted passage of the poison into the intestine and was only exceptionally effective when four hours had elapsed after a poison had been taken and in unconscious patients there was evidence of aspiration into the pulmonary passages.

Gastric lavage should be performed with a relatively large tube, to the proximal end of which can be fitted an aspirating bulb (250 cc. size). The first step after inserting the tube is complete aspiration of the stomach contents by repeated aspirations. After evacuation is complete, one begins the lavage proper by alternate injecting of a bulbful of water and then aspirating, the alternate injection and aspiration of bulbfuls being repeated until the returns are clear. The foot end of the bed should be elevated, the head turned to one side and an aspirator used to remove vomitus or other material from the mouth.

In the 117 cases in this study, 95 were lavaged. Eleven patients developed pneumonia following the ingestion of the poison and 100 per cent of these patients had received gastric lavage on admission. Undoubtedly some of these cases of pneumonia were due to aspiration of stomach contents during the lavage.

Summary

One hundred seventeen cases of acute poisoning in children with six deaths are reviewed.

A resume of some recently emphasized poisons with recommendations for therapy and the use of BAL are presented.

The importance of the proper performance of gastric lavage is emphasized.

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OREGON ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

The Tenth Annual Spring Postgraduate Convention in Ophthalmology and Otolaryngology will be held in Portland, June 19-24, 1949. Another fine program has been arranged by the Oregon Academy and the University of Oregon Medical School. They are particularly fortunate in having four outstanding men in their respective fields as guest speakers.

Dr. Lawrence R. Boies, Professor of Otolaryngology at University of Minnesota Medical School, Minneapolis.

Dr. Leland Hunnicutt, Associate Clinical Professor of Otolaryngology at University of Southern California, Los Angeles.

Dr. James H. Allen, Professor of Ophthalmology at Iowa State University School of Medicine, Iowa City.

Dr. Edmund B. Spaeth, Professor of Ophthalmology at Graduate School of Medicine, University of Pennsylvania, Philadelphia.

There will be lectures, clinical demonstrations and ward rounds.

Preliminary programs will be out about May 1st and you may secure yours, and further information, from Dr. David D. DeWeese, Secretary, 1216 S.W. Yamhill Street, Portland 5, Oregon.

Ovarian Tumors in Infancy and Childhood

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OVARIAN tumors are in no sense a disorder strictly confined to adulthood for care by the gynecologist. In children, in fact, they more frequently first come under the care of the family physician or of the pediatrician. During the past three years we have had the unique privilege of assisting in the care of six separate ovarian tumors which have occurred in children ranging from four months to sixteen years of age. This small series seems worthy of review in order to emphasize the more common presenting symptoms, physical findings, tumor-cell types and prognosis.

Figure 1 represents a comprehensive table of the general types of ovarian tumors; those starred indicate the ones which have occurred in our series. It is at once apparent that we have met with only a few of the entire group but these starred types are representative of the most common ones seen in infancy and childhood, the single exception which we have not encountered being the feminizing granulosal cell carcinoma.

OVARIAN TUMORS

CYSTIC TYPE	SOLID TYPE
BENIGN:	BENIGN:
*Follicular	Fibroma
*Paraovarian	Brenner
Corpus luteal	MALIGNANT:
Germinal inclusion	*Non-functioning*
Endometrial	*Teratoma
*Dermoids	*Sarcoma
Serous cystadenoma	Dysgerminoma
Pseudomucinous cystadenoma	*Functioning*
MALIGNANT:	Granulosal cell
Serous cystadenocarcinoma	*Arrhenoblastoma
Pseudomucinous cystadenocarcinoma	Adrenal
	Thyroid

Figure 1. Schematic representation of the principal types of ovarian tumors. Those marked with an asterisk were encountered in the series reported here.

Over two hundred ovarian neoplasms have now been reported in the pediatric literature. Approximately 60 per cent of these have been of the solid malignant variety; about 20 per cent are dermoids; and about 20 per cent are simple cysts.

CYSTIC TUMORS OF THE OVARY

Cysts of the ovary and paraoophoron structures have been noted at birth, in early infancy and at all stages of childhood. They have been detected as discrete abdominal masses on routine office examinations and they have attracted attention (1) by intermittent lower abdominal discomfort, (2) by progressive enlargement of the abdomen and (3) by acute episodes of severe abdominal pain resulting from torsion of the pedicle. General abdominal and rectal examinations reveal a cystic mass which is usually non-tender but which may be quite tender if it is twisted and infarcted. Simple cysts contain a clear amber fluid and dermoids contain hair, sebaceous material, teeth and other ectodermal elements. Teeth and bone, when present, can usually be detected roentgenologically.

CASE REPORTS

1. *Paraovarian Cyst:* B. B. was a 4-month-old female infant who had a right lower quadrant mass palpated on a routine office visit. There had been no symptoms. Physical examination revealed an egg-sized, round, moderately firm, non-tender mass in the right lower quadrant of the abdomen. Nothing was detectable upon rectal examination. Pyelograms were normal. At surgery a large, oval, bluish-grey, translucent cyst was found at the lower end of the right abdominal gutter. This proved to be a paraovarian cyst which measured 15x10x10 cm. It was removed without sacrifice of the normal tube and ovary. Convalescence was uneventful.

2. *Ovarian cyst:* L. D. was a 13-year-old adolescent girl who, two years before admission, had a mild attack of right lower quadrant abdominal pain. At that time her temperature and white blood count were normal. The local physician thought she had an appendiceal abscess. When Dr. Wyatt saw the child in consultation, he felt she had a right lower quadrant cyst about 6 cm. in diameter and recommended surgery which then was not carried out. Menses had been entirely regular from the age of 10 years. Twenty-four months later she was brought to Minneapolis because of her embarrassment over her enlarged abdomen. Now the cystic mass filled the entire abdomen. Pyelograms were normal but a large soft-tissue shadow filled the abdomen to above the umbilicus. By x-ray no fetal parts were seen. At surgery a large, smooth-surfaced, thin-walled right ovarian cyst was visualized, the pedicle of which was twisted 360 degrees. The tube was stretched and partially infarcted. A right tube-oophorectomy was done. The specimen weighed 14 pounds and measured 28x22x14 cm. Convalescence was uneventful.

3. *Dermoid Cyst:* A. N. was a 15-year-old female who had suffered from vague abdominal discomfort for two and a half weeks. Once during that time her temperature spiked to 104° F. and she had one attack of vomiting. Menses had been regular from the age of

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13 years. Upon admission to the hospital she had left lower quadrant and left vault tenderness. The white blood count was normal. A flat film of the abdomen showed two shadows in the pelvis consistent with teeth (Fig. 2). At surgery a glistening, gray, smooth-walled left ovarian tumor measuring 9x8x6 cm. was removed together with its tube. This proved to be a dermoid containing sebaceous material, hair and two teeth (Fig. 3). Convalescence was uneventful.

Solid Tumors of the Ovary

Benign solid tumors of the ovary are extremely rare in childhood. Of the malignant solid tumors many more are non-functioning than are functioning. Of the former the teratomas are fortunately the most common; generally they have slow local extension, late metastases and infrequent recurrence. Sarcomas, on the other hand, are quite rare, proliferate rapidly and metastasize early. Of the functioning tumors the feminizing granulosal cell type is the most common; a number of these have been reported in the pediatric literature and they usually exhibit enlarging breasts, fine pubic hair and premature menstruation. Of the nearly 100 defeminizing arrhenoblastomas now reported in the literature only eleven have occurred in adolescent girls between 12 and 18 years of age; all have exhibited masculinizing signs including amenorrhea, hirsutism, voice change, breast atrophy and hypertrophy of the clitoris. Between 10 and 14 per cent of these arrhenoblastomas have had metastases.

The clinical features of the solid ovarian tumors have been those of an enlarging lower abdominal or pelvic mass which may or may not be fixed. Pain is rare unless torsion has occurred. Female sexual precocity, defeminization of the adolescent child and masculinization of the female suggest endocrine dysfunctions consistent with the appropriate ovarian tumor types, i. e., granulosal cell tumor, arrhenoblastomas and adrenal rests within the ovary.

Case Reports

1. *Ovarian Teratoma:* K. B. was a 9-year-old female who was sent to the hospital for intermittent, crampy, lower abdominal pain of three days' duration. For several weeks the patient had been constipated but only after the onset of acute pain did she have nausea with vomiting. Physical examination revealed a small, hard, oval, right vault mass which, on barium enema, compressed the recto-sigmoid extrinsically. At surgery a solid left ovarian tumor was readily removed sparing the fallopian tube. This teratoid tumor measured 9x7x6 cm. and contained sebaceous material, hair, bronchial structures and brain tissue. The follow-up, to date, had been satisfactory although this has covered only two and one-half years.

2. *Ovarian Sarcoma:* P. R. was a 5-year-old female who was sent into the hospital for study. Three weeks before admission she fell down and subsequently had left pelvic pain which did not improve with two weeks of bed rest. One week previously a non-painful swelling occurred behind her left ear. Pelvic examination revealed an orange-sized freely movable right adnexal mass. Blood studies were normal. X-rays of the skull, chest, pelvis and long bones were normal. At surgery the neck node was biopsied but no tumor was found on frozen section. After opening the abdomen both ovaries were removed because they were involved with bilateral tumors. Permanent sections showed that both ovarian



Fig. 2.



Fig. 3.

masses and the cervical node were all involved with rapidly growing sarcoma. The patient was dead in a very few months.

3. *Arrhenoblastoma:* J. H. was a 16-year-old female who was admitted to the hospital because of amenorrhea of two years duration, deepening of her voice, atrophy of the breasts, hirsutism of her face and chest, hypertrophy of the clitoris and an enlarging lower abdominal mass. At surgery an enormous well-encapsulated left tubo-ovarian tumor was removed which weighed 8.2 pounds and measured 20x20x15 cm. The original sections showed male testicular architecture consistent with arrhenoblastoma. Convalescence was uneventful. Three weeks later her menses were resumed, her voice went up several notes higher, her breasts filled out again, the hirsutism regressed and her clitoris slowly receded.

One year later her voice began to deepen again and her clitoris enlarged to four times the normal size. At re-exploration she had tumor implants removed from the omentum, visceral and parietal peritoneum and the left broad ligament. From this operation the tumor sections show mostly striated skeletal muscle fibers. Final interpretation of this tumor is still undeterminable: numerous sections of the material removed at the first operation were entirely consistent with arrhenoblastoma while those from the second operation are more suggestive of malignant teratoma. No matter what it finally proves to be, x-ray therapy has been carried out, the girl is alive and well but the prognosis is poor.

CONCLUSIONS

Brief comments are made on the symptoms, signs, pathology and prognosis in the more common types of ovarian tumors in infancy and in childhood.

Six case reports are included on patients treated during the past three years (Fig.4).

ADDENDUM:

Since this material was presented before the Northwest Pediatric Society in October, 1948, we have had two additional cases of dermoids of the ovary. One was in a five-year-old and the other in an eight-year-old. Both tumors were easily removed; convalescence was uncomplicated; and no evidence of malignancy was found on microscopic examination.

No.	*Age*	*Type of Growth*	*Side Affected*	*Size* (cm.)	*Weight*	*Operation*	*Follow-up*
1.	4 months	Paraovarian cyst	Right	15x10x10	——	Excision of cyst	Excellent
2.	13 years	Simple cyst	Right	28x22x14	14 lbs.	Salpingo-oophorectomy	Excellent
3.	15 years	Dermoid	Left	9x8.5x6	——	Oophorectomy	Excellent
4.	9 years	Teratoma	Left	9x7x6	——	Salpingo-oophorectomy	Excellent
5.	5 years	Sarcoma	Bilateral	7x5.5x4 4.5x3.5x3	——	Bilateral oophorectomy	Dead
6.	16 years	Arrhenoblastoma Recurrent	Left	20x20x15 17x12x12	8.2 lbs.	Oophorectomy; Excision of implants	Still alive

Figure 4. Summarizing chart of the six cases of ovarian tumors in infancy and children reported in this series.

DR. E. T. BELL TO BE HONORED

On June 15, 1949, Dr. E. T. Bell, Professor of Pathology, reaches the age of retirement and will relinquish the chair. He has served the University since 1910, first teaching in Anatomy, and from 1911 until the present time in the Department of Pathology. He was appointed head of the department in 1921 and in this capacity has directed its activities in the intervening years. Everyone who has had any contact with medicine in the Northwest knows how profound his influence has been, not alone on teaching and research in pathology, but on the practice of medicine, as a whole.

Many physicians and former students have brought to the Minnesota Medical Foundation the request that a fund be established in Dr. Bell's honor, to perpetuate in some measure his influence as a teacher, investigator, and consultant.

As a result of these requests, an advisory committee was appointed and has recommended the establishment of a fund of $100,000 to create and maintain for teaching and research a Museum of Pathology in the Medical School, which will bear his name.

The Sponsoring Committee feels confident that there will be a gratifying response to requests to his many friends and admirers for subscriptions to this fund. It has been suggested that contributions might range from $100 to $1,000 or higher in individual instances.

The Bell Fund will be launched at a dinner given in Dr. Bell's honor at the Minnesota Medical Association Meeting in May.

Some Problems in Dealing with Parents

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This paper is concerned with the way in which a Child Guidance Unit approaches parent-child relationships, particularly from a parent's point of view. Much has been written and said about the child's point of view and there is a growing mass of literature about techniques for working with children. Too often, however, it has seemed to us that the parents are ignored or dismissed with the statement: "Parental attitudes were found to be faulty and were corrected." One wonders if it is really as simple as that. Does this statement imply that there was really nothing wrong with the child; are we saying it was all mother's fault or father was crabby? "Just stop being crabby and tired and irritated, parents, and your children won't develop behavior problems; they will stop biting their nails, their beds will be dry, temper tantrums will cease, school marks will rise and the little angels will love milk and eat all their suppers—just give them a chance." We see quite a different picture in our office.

The statement "there are no problem children, only problem parents" is often quoted. It seems to us that this is only another way of saying "the sins of their fathers shall be visited upon them, yea, even unto the third and fourth generations." As a reaction to these moralistic concepts we, at least, prefer to subscribe to minority reports such as that of Dorothy Baruch who wrote an excellent book called *Parents Can Be People*. It seems to us that parents *do* have rights, parents *are* people, struggling, suffering, feeling persons who are, more frequently than not, as disturbed and unhappy as their children.

Our job in child guidance then is only half done if we concentrate on the child to the exclusion of his parents. The point of attack on the problem, as we see it, is the relationship between the child and his parents. This relationship may be difficult to evaluate at first but usually can be pretty clearly defined in a few interviews. For example, a mother and her ten-year-old son came to us some time ago because of the mother's concern over the child's extreme fears. In the course of a few interviews it became very clear that the mother, whose marriage had always been unhappy, was attempting to get emotional satisfactions, which she otherwise might have obtained from her husband, from the ten-year-old. She was, without being aware of it, exploiting the boy by expecting him to give her emotional support which he did not have to give. In that relationship the boy was trying to meet his mother's emotional needs and the parent was trying to make up for her own deprivations. The emotional growth of both was hindered; the needs of neither were satisfied. We were able to help these people find satisfactions outside of their relationship so that each became freer to give to the other and to develop independently of one another.

This mother came to us saying, "I don't know how to handle my son's fears. Tell me what to do." This is the most common problem which we have to face with parents who come to us for help: "Tell me what to do. I know that something is wrong with Joey and if you can just tell me how to handle him, I am sure that everything will be all right." In other words, "Give me a formula or rule book for rearing my children." If such a formula or rule book were only 75 per cent effective, I am sure that it could be placed in ten million homes next week.

Of course, it is flattering to us as professional people to be asked for such advice. But it is equally obvious that there is no pat answer. Advice is a treacherous therapeutic approach. Even when we speak the literal truth we may stir up anxieties instead of allaying fears as we intend. For example, parents often ask for advice on what to do about masturbation. You and I know that it is the parents' concern which makes this a problem in many instances. But the facts of puerile masturbation are not acceptable to a large number of parents. A mother told me recently, "Doctor So-and-So told me that I shouldn't worry if Jimmy plays with himself but, Doctor, I can't stand to have a child of mine do that . . . it just makes me sick to my stomach every time I see him do it . . . I don't know where he could have picked up such a nasty habit." To tell Mrs. S. not to worry accomplishes nothing. Mrs. S.'s anxieties about sexual matters, never under good control, have been mobilized by her son's interest in his sexual apparatus. And so there is a very considerable tension between Jimmy and his mother. He begins to resent and to react to the constant surveillance; mother becomes more anxious. She feels she can't return to Doctor So-and-So because she is being a "bad" parent by not following his advice. Father has a talk with Jimmy but the habit continues or is replaced by aggressiveness which mother is unable to take and she may go to a child guidance clinic and say, "Tell me what to do."

The next most common problem in our experience is that of the parent who feels guilty and depressed because she is sure that she is to blame for the child's misbehavior or his illness. In the same category is the very defensive parent who has been sent unwillingly to us for help and who seems to expect to be scolded or browbeaten into changing her method of handling her child. Basically both the guilty and the defensive parent feel intimidated and insecure. Both are unhappy with the knowledge that they must seek help for problems which, in their eyes, other parents handle as a matter of course.

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By this time you may be saying, "Yes, yes, but what do you do about it? We see these parents every day. How do you help them?"

First of all, with the decision to seek help a parent makes the first step towards change. By introducing specialized help into the relationship between parent and child, the parent indicates some capacity for growth and a desire for change. With the first step there is some relaxation of the tensions between mother and child. Each relaxation of tension makes more relaxation possible and, ideally, there is eventual resolution of the immediate problem as well as growing strength to be used in handling problems which arise later. Dr. Spock speaks of this as a descending spiral. Once in the office the parent finds that though we will not tell her "what to do" we can and will listen to her story sympathetically. Though we have no formula we will help a parent to find what is right for her to do based on her feelings rather than on some theoretical standard. There are few parents who really want to be told how to raise their own children.

In an atmosphere of acceptance and understanding, even very disturbed mothers and fathers can come to understand and accept themselves. Previously repressed "bad" feelings find their way to the surface once a parent is sure that he or she will not be criticized for having such feelings. With support from the therapist the patient then can begin to deal with the "bad" feelings instead of repressing them.

Some parents cannot admit any negative feelings for their children, even to themselves. They seem to feel that to do so would be a social and personal disgrace. They keep repeating: "But I do love my child," as if they themselves doubted it. One such mother said, near the end of treatment, "I was afraid to let myself be angry because somehow I think I blamed Jerry for being sick so much. Now when I am cross with him, it is because of something he has done, not because I blame him for being born."

A more difficult problem is one in which the child's symptoms of maladjustment are the result of long standing parental discord. The child is almost invariably aware of the parents' negative feelings for each other; his awareness cannot but make him insecure and unhappy. The parents' views on rearing of children may be quite divergent so that the child becomes confused as to what is expected of him. In such instances it is imperative that the parents clarify and work through their basic problem before the child can receive lasting benefit from treatment. This may be a long and difficult job.

In families with several children the problem of sibling rivalry can reach major proportions. Here parents can be helped to understand how threatened the older child becomes when a younger sibling appears. Both the older and younger siblings need support if they are to acquire the feelings of security and adequacy needed for them to develop the initiative for independent functioning as individuals. Most of us underestimate the rapidity with which children acquire the desire for independence. In our efforts to provide protection we may erect so many limitations that the child loses self-confidence or he may react with rebellious and defiant attitudes towards the restrictions designed to protect him.

When problems of sibling rivalry arise or when it is obvious that the parent has not recognized the child's need for independence, there may be rapid improvement as the parent acquires an understanding of the child's needs. Too often, this improvement in the child's behavior comes before the parent recognizes any of the deeper attitudes which are really basic to the problem. They may discontinue their visits to the clinic, then when a new facet of maladjustment appears, as it usually does when the deeper problem remains untouched, the parents may project onto the school, bad companions, or the doctor. Other individuals may go on from a discussion of the parent-child relationship to psychiatric treatment for problems unrelated to the matter which brought them to the office. We must then be equipped to go on with treatment which is no different from usual psychiatric practice.

Sometimes we are asked to help parents accept the fact that their child is permanently handicapped. This may take as much time and skill as a difficult treatment problem. Or we may be asked to see a parent who is confused as to whether or not she should place her child for adoption. For most mothers, giving up a child is a difficult and painful experience, even though it is the only feasible course open to them. Parents who adopt children, as well as the children who are adopted, present another special case. In all of these instances it is important to see clearly the relationship between parent and child.

In summary, child guidance, as we see it, involves guidance for parents also. In helping parents to unravel their relationships with their children, it is not enough to give advice. We must be prepared to work with disturbed and unhappy children and their mothers and fathers who may all be confused and suffering people.

Craniotabes

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Softening of the skull is known as craniotabes. It occurs in newborns, particularly prematures, hydrocephalus, osteogenesis imperfecta, and in rachitic infants.

According to the generally accepted view, the underlying metabolic disorder in rickets caused by vitamin D deficiency is an inability to maintain and stabilize the levels of calcium and inorganic phosphorus in the blood serum which results in defective calcification of the bones. During the first eight months of life, the skull bears the brunt of the attack. It grows with great rapidity at this time. The stress caused by the recumbent posture is almost continuously applied. Rachitic craniotabes is rarely present before the third month and tends to be localized in the parietal or occipital bones in the vicinity of the lambdoidal suture.[1] Most cases of craniotabes after the fourth month are due to rickets supposedly. It is important to recognize this early sign before other rachitic deformities develop. Changes in concentration of serum calcium, phosphorus, and alkaline phosphatase are the earliest manifestations of rickets and will antedate x-ray changes in the long bones.

In Table 1 are the blood chemistries of four normal children.* In Table 2 are the blood chemistries of sixteen children with craniotabes only. In Table 3 are the

*All the children in this study were Negroes.

Table 1

Age	Calcium Mg. %	Phosphorus Mg. %	Alkaline Phosphatase Bodansky Units	Total Serum Protein Gm. %
1 yr. 2 mos.	11.7	7.2	12.0	7.6
11 mos.	10.2	6.0	14.4	6.7
11 mos.	10.9	7.6	11.2	6.6
9 mos.	11.6	5.9	8.9	6.1

Table 2

Age	Codliver Oil	Calcium	Phosphorus	Alkaline Phosphatase	Total Serum Protein
7 months	10 drops since 6 weeks	10.9	5.4	7.0	6.0
6 months	none				
6 months	5 drops since birth	11.0	9.6	q.n.s.	7.4
5 months	1 teaspoon	11.0	7.6	7.6	5.5
8 months	2 tsp. till 6 months	10.6	5.6	15.2	cloudy
		10.9	7.0	21.0	5.2
6 months	irregularly	10.2	4.8	11.4	5.4
8 months	2 tsp. irregularly	11.2	5.1	11.1	q.n.s.
4 months	10 drops irregularly	10.1	3.0	12.2	5.9
		11.2	6.0	10.6	5.7
5 months	10 drops irregularly	11.3	6.0	10.4	6.1
5 months	10 drops started at 3 mos.	11.1	5.4	13.0	7.0
4 months	2 tsp. from birth	11.0	6.2	15.4	5.5
4 months	1 tsp. irregularly	11.8	6.0	21.2	6.0
5 months	2 tsp. since 1 week	11.4	6.0	13.2	6.0
5 months	?	12.6	5.8	19.0	5.6

Table 3

Age	Codliver Oil	Calcium	Phosphorus	Alkaline Phosphatase	Total Serum Protein
3 months*	no codliver oil	7.2	7.0	40.6	5.0
	no orange-juice	5.5	5.6	31.4	
6 months	no codliver oil no orange-juice	9.9	3.0	75.0	6.5
5 months	10 drops codliver oil irregularly	8.3	3.0	149.0	4.8
7 months	none	10.0	3.6	20.0	
1 year	none	10.3	3.0	21.0	5.8

*This patient had tetany with generalized convulsions.

blood chemistries of ten children with craniotabes and x-ray evidence of rickets in the long bones.

In these sixteen children who had craniotabes without other evidence of rickets at the time the chemistries were drawn, the values for serum calcium, phosphorus, and alkaline phosphatase invariably fell within the limits of normal.

SUMMARY

Chemistries of children under one year of age with craniotabes as an isolated phenomenon were compared with those of rachitic children and well children.

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NORTH DAKOTA STATE MEDICAL ASSOCIATION 1949 ANNUAL MEETING

The Sixty-second Annual Meeting of the North Dakota State Medical Association, together with the Third Annual Meeting of the Woman's Auxiliary, will be held in Minot, North Dakota, May 14, 15, 16 and 17, 1949.

The House of Delegates will meet the evening of Saturday, May 14, and on Sunday, May 15. The Scientific Program will be held on Monday and Tuesday, May 16 and 17, in the Gold Room of the Clarence Parker Hotel, with the exhibits on display in the Saddle Room of the Hotel.

The Northwest District Medical Society is in charge of all local arrangements. Local committees have been appointed and plans are being made for an even larger attendance than in past years. Reservation cards will be forwarded all members of the Association well in advance.

Plans for the Third Annual Meeting of the Woman's Auxiliary are under the supervision of the General Chairman, Mrs. J. L. Devine, Jr., Minot, North Dakota.

American College Health Association News

The annual meeting of the American College Health Association will be held at the Henry Hudson Hotel, 353 West 57th Street, New York 19, New York, on December 29-30, 1949. Hosts for the meeting will be New York University, represented by Dr. J. E. Sawhill, and Columbia University, represented by Dr. C. R. Wise.

Dr. William G. Beadenkopf will assume the directorship of Chicago University Student Health Service beginning July 1, 1949. Dr. Clayton G. Loosli is leaving this position to become Head of Preventive Medicine in the Department of Medicine at the University.

Copies of *A Health Program for Colleges*, a report of the Third National Conference on Health in Colleges, may be procured from Dr. L. W. Holden, director, Student Health Service, University of Colorado, Boulder, Colorado, at $1.25 each, including postage. This report is out in book form and should be in every student health service and college library.

The American College Health Association welcomes the following institutions into its organization:

Colorado Agricultural & Mechanical College, Duane Hartshorn, M.D., Ft. Collins, Colorado.

Cornell College, Marian A. Van Fossen, R.N., Mt. Vernon, Iowa.

Eastern Illinois State College, Charles L. Maxwell, M.D., Charleston, Illinois.

Fort Hays, Kansas State College, R. B. Michener, M.D., Hays, Kansas.

Illinois Institute of Technology, Charles J. Smith, M.D., Chicago, Illinois.

Loyola University of Los Angeles, Carl G. Kadner, M.D., Los Angeles, California.

Otterbein College, Dale E. Putman, M.D., Westerville, Ohio.

Union Theological Seminary, Howard W. Brown, M.D., New York, New York.

University of Western Ontario, Helen N. Rossiter, London, Ontario, Canada.

Since the March issue of the JOURNAL-LANCET, the American College Health Association has received notice of the following college health service position:

Director of Health Service, full time, for University of Maine. Physician with administrative as well as professional skill is needed to handle administrative matters pertaining to the Health Service and to supervise work of seven nurses and various other employees. The Health Service includes examinations, preventive measures, clinic and dispensary services, infirmary care, etc. Student body numbers 4,000 and is co-educational. Write: E. E. Wieman, Chairman, Faculty Committee on Student Health, University of Maine, Orono, Maine.

Each month the American College Health Association will list new vacancies as they are received. Any information concerning positions or applicants may be forwarded to the A.C.H.A., Dr. Edith M. Lindsay, Secretary-Treasurer, School of Public Health, University of California, Berkeley 4, California.

Diphtheria Trends in Minnesota

Sheldon C. Siegel, M.D.*
Minneapolis, Minnesota

Until recently there had been a progressive decrease in the incidence and mortality rate of diphtheria in the English-speaking countries and in Europe. In 1947 a new all-time low diphtheria death rate, 0.53 deaths per 100,000, had been reported in the large cities of the United States.[1] This special report concluded that "diphtheria, like typhoid, continues to approach the vanishing point."

Despite the fact that diphtheria is not the great problem it was a few years ago, the disease has, by no means, been eradicated, nor have all of the perplexing questions concerning it been solved. An illustration of this fact is the increase in number of diphtheria cases in the state of Minnesota since 1942. Some idea of the magnitude of the incidence and mortality of this preventable disease may be obtained from Table 1, showing reported cases and deaths from diphtheria and poliomyelitis in Minnesota for the ten year period from 1937 to 1947.[2]

Table 1

Year	Diphtheria Cases	Diphtheria Deaths	Poliomyelitis Cases	Poliomyelitis Deaths
1937	*364	13	354	50
1938	*286	*12	48	10
1939	188	11	563	53
1940	122	6	258	26
1941	129	7	296	35
1942	*139	*12	81	6
1943	*375	*20	160	10
1944	508	16	534	37
1945	*476	22	235	27
1946	764	43	2,881	221
1947	*499	*20	176	19
Total	3,840	182	5,586	494

*Indicates the morbidity or mortality of diphtheria exceeded that of poliomyelitis.

Surprisingly enough, one can see that the actual incidence of diphtheria was greater than the incidence of poilomyelitis in six of the ten years. The number of deaths from diphtheria surpassed those from poliomyelitis in four of the ten years. If 1946 had the usual number of poliomyelitis cases, or say, 1000 instead of an epidemic number of 2,881, the number of diphtheria cases for that ten year period would have been greater than the total number of poliomyelitis cases.

Because diphtheria is far from the vanishing point in Minnesota, it was thought worthwhile to review all of the cases of diphtheria that had been hospitalized at the Minneapolis General Hospital from 1937 to 1947, with the hope of learning where the medical profession might have failed in preventing this disease.

Some of the findings from this review of 210 bacteriologically proved cases of diphtheria will be presented, particularly in regard to age incidence and immunization records. Later in the discussion some literature pertinent to the immunization of the young infant, the older child, and the young adult, will be reviewed.

Not only has there been a change in the actual incidence of diphtheria, but there have been a great many reports in the literature which show that there has been a shift in the age incidence of diphtheria throughout the world. In most places the shift has been from the pre-school age to the school-age group. In other areas, however, the shift has been to older age groups. In reviewing the age incidence of diphtheria during an epidemic in Canada, Gibbons [3] stated that 45 per cent of their cases occurred in persons over 15 years of age. Similar types of age incidence have been reported by Walker [4] in Germany, Ipsen [5] in Denmark, Russel [6] in England, and Galperin [7] and Geiger [8] in this country. Fleming [9] has shown that this same trend, that is, a trend for adolescents and adults to become afflicted, has occurred in our own state of Minnesota.

In the 210 Minneapolis General Hospital patients, 18.1 per cent (38) were in the 0–4 age group, 35.7 per cent (75) in the 5–14 age group, and 46.2 per cent (97) were 15 years of age or older.

Why has this shift in age incidence come about? A multiplicity of factors were and are present in bringing about this change. Probably three of the most important of these factors are the following:

1. Diphtheria immunization in infancy has become widespread;
2. As a result of widespread immunization, the incidence of diphtheria and diphtheria carriers has been reduced;
3. The decreased number of diphtheria cases and carriers has resulted in a lack of natural immunity.

Since immunity to diphtheria wanes with the passage of time, the older the individual gets, the more susceptible he is to diphtheria. In the past, when diphtheria was rampant among the population, the older individuals maintained their immunity by being exposed to frequent small doses of diphtheria bacilli. Now, with relatively little diphtheria prevalent in the community, one has to depend on artificial immunization for immunity. This is clearly shown by the numerous reports in the literature of the increased number of Schick positive adults.

Previously, only about 20 per cent of individuals over 20 years of age were Schick positive; whereas, now, according to extensive surveys in the English speaking

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countries, 40 to 80 per cent of individuals over 20 years are positive.[10] Diehl[11] and Boynton[12] found in University of Minnesota students, 52 per cent and 63.6 per cent positive Schick tests respectively. The latter study consisted of 34,244 students who were Schick tested.

Another factor that has been considered important in this age shift by other writers is the virulence of the organism. McLeod[13] in his extensive review of the literature on the three types of diphtheria—gravis, intermidius, and mitis—pointed out that with the appearance of the more toxic forms of diphtheria in Central Europe, there was a coincident rise in age incidence. He attributed the latter partly to the introduction of the gravis strains.

An additional explanation given by Cheeseman,[14] et al, on the basis of a statistical study, was that due to the falling birth rate and general amelioration of social conditions, there was decreased congestion of the population. This in turn, they argued, led to fewer exposures in childhood, and hence a larger proportion of susceptible children in schools.

With this increase in age incidence, increased susceptibility of older individuals, and the loss of artificial immunity with the passage of time, the control of diphtheria must be concerned not only with a wider age group than previously, but also with the necessity of maintaining immunity once it has been established.

That immunization is effective in helping to control diphtheria can no longer be questioned. McKinnon,[15] Gibbons,[3] Schulze,[16] Glover,[17] and other authors have shown that the incidence of diphtheria among immunized individuals averages about 10 to 15 per cent of that among non-immunized controls. Furthermore, the remarkable reduction in case and death rates in this country can undoubtedly be related to the increase in diphtheria immunization. Moreover, Gibbard,[18] Fanning,[19] Mortensen,[20] Ipsen,[21] and many others have shown that diphtheria is much milder in the immunized person.

The records at the Minneapolis General Hospital approximately conform to what these other authors have reported in the literature (see Figure 1). Of the 210 cases, 118 (56.2 per cent) gave a history of having no immunizations; 26 (12.4 per cent) gave a history of one or more inoculations for diphtheria at intervals varying from one month to twenty-one years prior to admission to the hospital; and 5 (2.3 per cent) gave a history of having had diphtheria some years before. The charts of 61 (29.1 per cent) patients contained no information of immunization. It was interesting to note that 10 patients had been in the Army or Navy and had received the routine immunizations which did not include immunization against diphtheria.

The cases were further divided into immunized and non-immunized and compared on the basis of severity. All patients who died, had tracheotomies, or were placed on critical by the staff, were considered severe. The differentiation of moderate and mild was based on the history and condition of the patient. Figure 2 illustrates that the immunized group had a milder diphtheria and

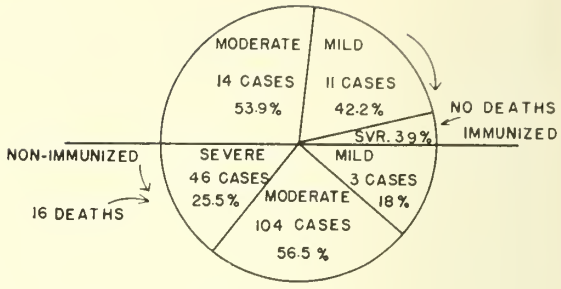


Fig. 1. Severity.

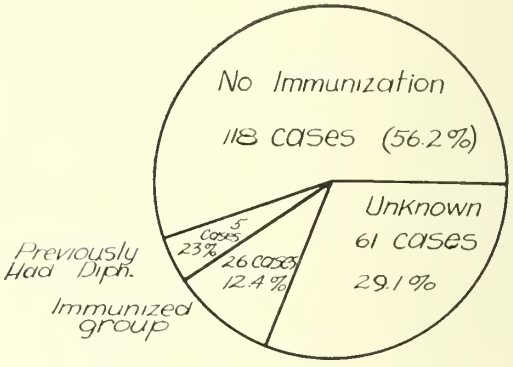


Fig. 2. Immunization Record, 210 Cases.

that all the deaths occurred in the non-immunized group.

It is evident from the above figures that it is largely the lack of immunization rather than defects in the type of immuinzation that still gives rise to diphtheria cases and deaths. And in some instances, it was the erroneous beliefs of some physicians that all adults are immune or that children maintain their immunity after once being immunized, that kept the patient from being immunized. In other instances, it was the fear of severe reactions that was responsible for the seeming negligence.

Immunization in infancy, and the subsequent booster doses prior to entry to school rarely give any severe reactions, and mass immunizations can be carried out without much thought to hypersensitiveness. It is the immunization of the older child, adolescent, and adult that gives rise to relatively frequent reactions. Many of these reactions can be avoided if only Schick positive individuals are inoculated; when the Schick control consists of a Moloney test (the test consists of injecting intracutaneously 0.1 cc. of a 1:20 dilution of the toxoid to be used[22]), and when very small doses of toxoid are used in positive Moloney reactors.[23]

The experience at the University of Minnesota Health Service has been somewhat different than that reported in other parts of the world. In recent years, in immunizing university students, the Moloney test control has been discontinued and all Schick positive students receive a full dose of 1 cc. of alum precipitated toxoid with a repeat dose of 1 cc. two months later. On this regime, about 5 to 10 per cent of the subjects have systemic reactions of moderate severity, about 35 per cent report

swelling of their arms and 5 to 10 per cent subjectively complain of severe redness and soreness at the injection site. None of the several thousand students immunized required hospitalization because of a reaction to the toxoid.[24]

Though the above regime seems practical in mass immunization of young adults, the number of reactions probably could be reduced if smaller doses or no immunizations were given in hypersensitive individuals. Wishart, et al.,[25] Leete,[26] Edsall,[27] and very recently, Pappenheimer and Lawrence [28] have shown that there is a high degree of correlation between severity of reaction and the degree of immunity present, so that one can safely leave the Moloney positive reactions without any further stimulation. Furthermore, individuals who are hypersensitive or have received primary immunization usually develop a very high antitoxin titer when they receive minute booster dose stimulation.[29] Therefore, the Schick test and the Moloney test given to a sensitive individual or one who has been previously immunized will generally convert him to a Schick negative or immune state, and no further immunizations are necessary.

Although reactions in infancy are rare, the problem of when to begin immunization is still a controversial subject. With the decline of immunity in adults, there has naturally been an increased number of newborns who do not have a passive immunity from their mothers. This has been shown by such studies by Vogelsang and Kryvi,[30] who found 60 per cent of the newborns tested were Schick positive. However, if one waits the customary six months before immunizing, there is a long period in which the child is susceptible to diphtheria. One partial answer to this problem has been the antenatal immunization of the mothers as suggested by Liebling and Schmitz,[31] and Cohen and Scadron.[32]

Another possible answer came with the introduction by Sako [33] of early immunization for pertussis with an alum precipitated vaccine. Previously it had been believed that infants were poor antibody formers and that the passive immunity inhibited antigen activity; therefore, immunization was usually deferred until about six months of life. Sako and subsequent papers, including one by Adams et al.,[34] at the University of Minnesota, proved that infants could form antibodies. However, in a very recent paper, Cooke and his co-workers [35] found that passive immunity interfered with active immunization in diphtheria, especially in the first three months of life. In the three to six months age period, only 10 infants who had a passive immunity were studied, and certainly a larger study will have to be done before definite conclusions are drawn.

In contrast to Cooke's paper, Sauer [36] indicated in a recent round-table discussion on immunization that immunity to diphtheria and pertussis could be obtained after the third or fourth month of life by four monthly doses of an alum-precipitated mixture of diphtheria toxoid and H. pertussis.

Table 2 represents a schedule of active immunization that was recommended by the Committee on Immunizations, Chicago Pediatric Society.[37] Three alternative plans using triple or double antigens were recommended. Until further studies are done to confirm or disprove the work of Cooke, et al., or Sauer's work, or unless the mother or newborn is known to be Schick positive, Plans B or C are preferable. In the ten year period reviewed, only one infant out of the 210 patients hospitalized at Minneapolis General Hospital was under one year of age. This would further suggest that routine immunization for diphtheria before six months of age might not be necessary except under special circumstances, e. g., when older siblings or the parents have been exposed.

In addition to the above program for young children, children around twelve years of age should be Schick tested, and the positive reactors given booster doses or

Table 2

Schedule of Active Immunization
(Three available alternatives)

	A	B	C
3 months	Triple antigen (slow absorbing)*	Pertussin vaccine (slow absorbing)	
4 months	Triple antigen (slow absorbing*	Pertussin vaccine (slow absorbing)	
5 months	"	"	
6 months	"	"	Triple antigens † (fluid or slow absorbing)
7 months	Smallpox vaccination	Diphtheria and tetanus antigens	"
8 months		"	"
9 months		"	
10 to 12 months		Smallpox vaccination	Smallpox vaccination
2 years	Booster dose triple antigen (fluid or slow absorbing)	Booster dose triple antigen (fluid or slow absorbing)	Booster dose triple antigen (fluid or slow absorbing)

A booster dose or smallpox revaccination is recommended when a previously immunized child is presumably exposed to these diseases.

*Antigens that have been so modified as to be slow absorbins (e. g., alum-precipitated, aluminum hydroxide, etc.)

†Starting at 6 months of age or later, monthly doses of the antigens (fluid or slow absorbing), giving them singly or in combinations—as diphtheria-pertussis, diphtheria-tetanus, or diphtheria-tetanus-pertussis.

a full course of injections if they were not previously immunized. This should likewise be done to young adults whenever they are in frequent association and contact, e. g., colleges and the armed services. Also, all individuals who are likely to come in contact with diphtheria, e. g., doctors and nurses, should have frequent checks as to their immune status. And, of course, whenever there is an outbreak of diphtheria or an exposure, immunization or booster doses should be instituted at once in all individuals concerned.

This last recommendation should be emphasized because 25 of the 210 cases of diphtheria at the Minneapolis General Hospital could have been prevented or at least modified, had immunizations been started as soon as the exposure was known.

In all of the above immunizations, alum precipitated toxoid or other purified concentrates are preferred, and the injections should be at least one month apart. The dosage, though usually 1 cc., varies with the product used.

Summary

Two hundred and ten cases of diphtheria from the contagious service of the Minneapolis General Hospital are reviewed in regard to their age incidence and immunization history.

In addition, it is pointed out that diphtheria has shifted to an older age group, and that many young adults and newborns are susceptible to the disease, primarily because of a lack of natural immunity. Hence, an immunization program covering a wider age group with occasional booster dosages is necessary. Some recommendations are given in regard to approved immunization procedures.

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Late Rickets--with Moderate Vitamin D Resistance*

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The term "late rickets" has been given a variety of meanings by various authors, depending upon classifications according to etiology, pathology, metabolic alterations, or age of the patient. In 1909, Schmorl,[1] from pathologic studies of cases of florid rickets, stated that under the conception of late rickets are to be included . . . "not only those cases in which the disease began in the earlier growth periods but never disappeared—persistent rickets—but also those cases in which rickets developed for the first time in later periods of growth—late rickets in the narrower sense." He placed the onset of late rickets at age four years, the time when infantile rickets had statistically declined. More recently, late rickets has been subdivided according to etiology. Shelling and Hopper[2] have listed five divisions: persistent infantile rickets, recurrent rickets, true late rickets (juvenile osteomalacia), celiac rickets, and renal rickets. To these groups have been added cases of rickets resistant to ordinary doses of vitamin D,[3,4,5,6,7,8] and cases associated with more profound metabolic aberrations. At the present time, a variety of causes must be considered when a child past infancy is encountered who shows clinical manifestations of rachitic activity. Boyd and Stearns[9] have well stated that "the etiologic classification of late rickets is not simple, nor can it be made on the basis of casual or laboratory observations. Only through familiarity with the causative mechanism in each individual patient can therapeutic measures be directed into channels of maximum efficacy."

There are several conditions seen in children which have as components clinical features resembling true rickets. Perhaps the best known is renal rickets with renal insufficiency, retention of nitrogen and phosphorus, and compensatory depression of the serum calcium. Marked growth retardation is commonly seen, but rachitic deformities are less prominent. There is secondary parathyroid hyperplasia in response to the low calcium level, a factor which has prompted the name of renal hyperparathyroidism[10] for this condition. Fanconi[7] has called attention to a syndrome of rickets associated with renal glycosuria, polyuria, and mild acidosis. Boyd and Stearns[9] reported three cases resembling the Fanconi syndrome, but with chronic bronchitis, or hepatic impairment in addition. They found no evidence that these children were vitamin resistant. The necessity of differentiating between vitamin D resistant rickets and hyperparathyroidism was noted by Highman and Hamilton[11] in reporting a case of "intractable rickets" before the advent of massive vitamin D therapy. It is also recognized that a certain degree of overactivity of the parathyroids is probably present in all cases of active rickets, a response to the low level of the serum calcium.[12] Lastly, we must recall the clinical group of cases with disturbed epiphyseal growth, children with dyschondroplasia of several types. It is too easy to make this diagnosis on superficial physical examination in an older child, without seriously considering the possibility of the etiology being something for which there is specific therapy: vitamin D resistant rickets.

The concept of "resistance" to vitamin D as a specific clinical entity has developed with knowledge of the various forms of the vitamin, activated ergosterol derivatives, the "calcinosefaktor" of Holtz and Schreiber[13] and studies of the relative methods of action of vitamin D,[12,14] dihydrotachysterol,[13,15] and parathyroid hormone.[14] This is not the place to review the tremendous literature pertaining to the relative antirachitic and "calcemic principle" in the activity of the preparations mentioned. Such work has been well summarized elsewhere.[5,14,15] When the various vitamin D preparations were being clinically standardized fifteen years ago, it was realized that certain cases of rickets required much larger therapeutic doses than others, for no apparent reason.

Stearns and Boyd[16] in 1931 reported two cases of late rickets which healed only after giving 60 drops of viosterol daily. In that same year, Hess[17] reported a 5-year-old child which required 200 drops of viosterol daily before evidence of healing of his rickets could be demonstrated. This patient was given 1,600 drops daily for therapy with no ill effects. Jampolis and Londe[3] pointed out "the need of larger doses of viosterol in severe rickets" in a report of two brothers who required 20 cc. (600 drops) of viosterol daily before radiographic reversal of the rachitic activity was accomplished. The first report of a series of cases of late rickets successfully treated by viosterol was by Shelling and Hopper.[2] They studied 23 children with late rickets, some of them previous therapeutic failures on codliver oil. Complete healing was accomplished by viosterol with a maximum dose of 60 drops daily in every case except one which was lost from the series. These authors stressed the value of viosterol for the relative resistance of late cases because of its high concentration of vitamin D.

As yet we have not mentioned cases of "refractory rickets." The term would suggest true rachitic activity which did not respond clinically to even massive dosage of vitamin D. Such was the intention of the name "intractable rickets" as used by Highman and Hamilton.[11] Several references in the German literature,[18,19,20] would also fit into this group of cases, because the dosage given did not control the rachitic process. Since the success of Albright, Butler, and Bloomberg,[4] in treating a "refrac-

*Read before Northwest Pediatric Society at Bayport, Minn., September 1948.

tory" case with 1½ million units of vitamin D daily, other similar reports,[5,6,8,10,21,22,23,24] have proven the rationale of such massive therapy in the highly resistant cases. To our knowledge, there have been no cases reported which were truly refractory to "massive" therapy as the term is now employed. At present it is more correct to speak of the relative resistance of the rachitic activity to therapy with vitamin D concentrates.

The general features of resistant rickets have been described by numerous authors, whose findings agree closely. As with infantile rickets, the serum alkaline phosphatase is elevated, the serum calcium low to normal, and the serum phosphorus always low. The serum phosphatase does not return to normal until radiographic evidence of healing is complete, being a reliable laboratory test of rachitic activity.[4,25] The absorption of vitamin D is not impaired,[4,6,9,26] blood levels in excess of forty times normal having been observed in resistant cases under intensive treatment. In contrast to cases of infantile rickets, certain refractory cases tend to show normal excretion of calcium and phosphorus in urine and stools,[4] even being in positive balance for these elements during rachitic activity.[11] Cases have been reported [6] in which the above findings were not observed. There is general agreement that the primary difference in the resistant cases is merely their failure to respond to the standard methods of treatment, their specific resistance to the usual effects of vitamin D. A constantly observed manifestation of this tendency is the persistent low level of the serum phosphorus, even after radiographic healing is complete. This is perhaps the distinctive laboratory finding in highly resistant rickets. In 1931 Stearns and Boyd reported two cases [16] which healed with persistent low serum phosphorus, positive calcium and phosphorus balances, and a calcium-phosphorus-level product never above 35. Calcification was noted with the Ca. x P. product as low as 22. Others have since made similar observations.[5,27,30] The original successfully treated case of "refractory" rickets of Albright, Butler, and Bloomberg has now been followed since age 12 years until he was five years past cessation of growth at last report.[12] His serum phosphorus is still low, having ranged between 1 and 3 mgm. per cent during the period of observation. The massive dosage of vitamin D was discontinued after the age of epiphyseal closure, with no detriment to the patient's clinical condition. Gill [21] suggested that the vitamin resistance stops when growth ceases, but Albright has found that his first case must now be classified as adult osteomalacia, with low phosphorus and elevated serum phosphatase. The pathological physiology in these cases remains unexplained. The problem has been clearly presented in "the fact that absorption of large amounts of vitamin D by these patients was without effect on the rickets indicates that vitamin D itself is ineffective as an antirachitic factor. It is possible that this vitamin, like carotene, must be converted in the body before it becomes biologically active, or that some other mechanism is deficient." [6]

Clinical management of a case of vitamin resistant rickets must be planned in reference to the possibility of toxic manifestations resulting from dosage of vitamin D in excess of the amount necessary to cause healing of the rickets. It is recognized that doses which are not curative, even though massive by the usual standards, hold little possibility of causing the patient harm.[2,5] In the modern refined preparations of calciferol (viosterol), any toxic effects encountered are due entirely to excessive action of the therapeutic principle, rather than some indirect acting "toxic factor" [13,14] The clinical signs to be watched for, anorexia, nausea, vomiting, diarrhea, headache, lassitude, polyuria, frequency, are related to the ability of vitamin D to increase the serum calcium by mobilizing it from the osseous stores, the "calcemic principle." Serum levels of calcium below 12 mgm. per cent will not give rise to signs of clinical toxicity, such findings as albumin, calcium casts, or erythrocytes in the urine being encountered usually at the higher levels. The qualitative urine calcium test of Sulkowitch [28] satisfactorily reflects the level of the serum calcium, being strongly positive only when significant elevations are present. In 1943 the Council on Pharmacy and Chemistry of the American Medical Association recognized the necessity for massive dosage in cases of resistant rickets [29] and suggested a program of therapy similar to that of Eliot and Park. The dosage of vitamin D is to be doubled at intervals of three or four weeks, studies of the serum calcium, phosphorus, and alkaline phosphatase, as well as radiographic examination of the epiphyses to be made after each increase before raising the dosage again. The urinary calcium excretion and routine urinalysis should be noted at least at weekly intervals during the period of increasing dosage. The usual adjuncts of adequate calcium and phosphorus in the diet, with supplementary ultraviolet radiation, are still to be recommended. Such a program will allow safe treatment of the most resistant case of rickets, with full knowledge of the patient's responses at each step of the way.

Case History

G. N., female aged 8 years, was first seen at the Shriners' Hospital in February 1947 for bilateral genu varus, pain in the knees and ankles, and short stature. She was a normal infant, weighing 7 pounds 2 ounces at birth. After nursing several weeks, a Dextri-Maltose formula was prescribed. The infant disliked milk, but always took 3 to 4 ounces per feeding. Orange juice and 3 drops daily of viosterol were started at six weeks of age. Until age 1 year, the dose of viosterol did not exceed 5 drops per day. The child sat alone at 7 months, cut her first tooth at 11 months, walked with support at 19 months, at which time bowing of the legs was definite. At age of 1 year the doctor stated definitely that the child did not have rickets, in spite of marked restlessness and profuse cold perspiration. She was given 15 drops of viosterol daily for some time, and then all medication was discontinued. The child was first seen by a pediatrician at age 5 years, radiographs taken, a

year of observation suggested, no medication prescribed. At 6 years of age, surgical correction of genu varus was recommended by the pediatrician, refused by the family. The local physician prescribed 1 Multivitamin capsule daily, increased to 2 capsules daily shortly before the child appeared at the Shriners' Hospital one and one-half years later.

Other phases of the past medical history, systemic review, and the family history were non-contributory. The patient was referred as a case of disturbed epiphyseal growth, possible achondroplasia or chondrodysplasia.

On physical examination the child was found to be an 8-year-old white female in apparent excellent health, but 6 inches shorter than average for her age. The findings of clinical interest were definite fronto-parietal bossing of the cranial plates, recent extraction of 11 deciduous teeth because of decay, with the 13 remaining teeth showing no rachitic stimata. The thorax showed visible and palpable rachitic rosary. Heart and lungs were normal, blood pressure 94/56. There was mild diastasis of rectus muscles, tonus good. Epiphyseal flaring was palpable at wrists, knees, and ankles. The gross pathology was in the lower extremities, with marked anterior and lateral bowing of the femora, genu varus, bilateral internal tibial torsion of approximately 30 degrees, and mild pes planus. The gait was markedly "rolling," with widening of the base. It was necessary to hold the hips in full external rotation so as to overcome the natural tendency to pigeon-toe gait. Patient complained of pain in hips, knees, and ankles after moderate exercise. There was no disproportion between relative length of vertebral column and extremities.

Laboratory studies showed routine hemogram and urinalysis normal. Serum calcium 10.0 mgm. per cent, serum phosphorus 2.4 mgm. per cent, alkaline phosphatase 31.1 King-Armstrong units. Total serum proteins were 5.9 gm. per cent. Other diagnostic tests were considered normal, as follows: Kline and Kolmer negative, Mantoux negative, urine concentration to 1.029, urine Sulkowitch negative, P.S.P. excretion 72.5 per cent in one hour, Hanger's cephalin-cholesterol flocculation 0 in 24 and 48 hours, thymol turbidity 1.0 unit, intravenous bromsulphthalein retention 7 per cent in 45 minutes, fecal fat 21 per cent of the dry matter with dry matter 27 per cent of the total weight.

Radiographic studies on admission showed the gross deformities noted above, plus retardation of bone age, seven carpal centers being present. The epiphyseal regions were flaring, cupped, osteoporotic, and had a definite moth-eaten appearance. The classic rachitic changes are well demonstrated in the photographs (Fig. 1).

Initially the patient was placed on 1,000 units of vitamin D daily. When the true nature of the patient's condition was established, she was given 7,000 units daily of a concentrated vitamin D preparation for one month. On thise regime definite radiographic evidence of healing at the epiphyses appeared, and the serum alkaline phosphatase dropped from 31.1 to 20.7 K.-A. units.



Fig. 1. G. N., age 8 years, on admission. Epiphyses flaring, osteoporotic, epiphyseal line indefinite.

With a slight reduction in the vitamin dosage (to 5,000 units daily, as viosterol) the phosphatase rose to 47.3 K.-A. units. Subsequently the dosage was stabilized at 2.0 cc. daily of viosterol (20,000 units vitamin D), an amount which kept the phosphatase in the twenties, with progressive radiographic healing of the rickets (Fig. 2). During the course of observation in the hospital (13

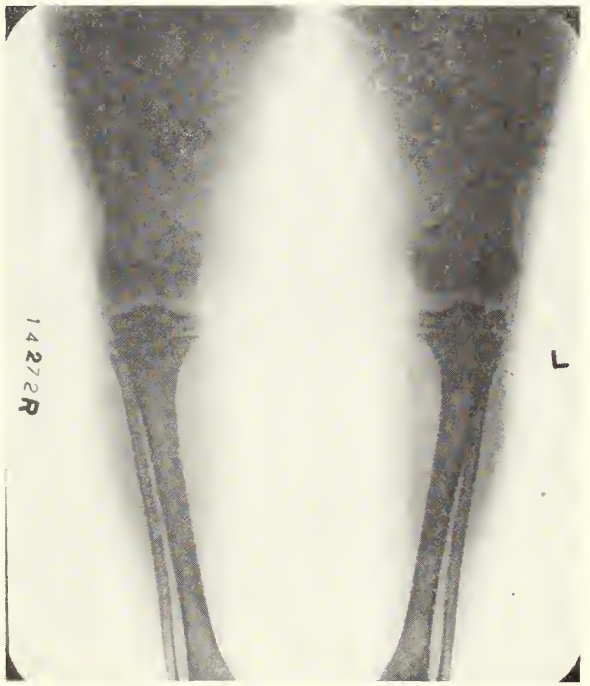


Fig. 2. G. N., after four months on 20,000 units of vitamin D daily. Closure of epiphyseo-metaphyseal gap, lines of "growth arrest," recalcification and clarification of epiphyses and metaphyseal contours.

months), the serum calcium varied between 10.0 and 11.7 mgm. per cent, the phosphorus being always below 2.6 mgm. per cent (2.0 to 2.6).

Six months after admission the patient underwent bilateral tibial osteotomies, the correction being held with long leg plasters. Due to the associated gross deformity of a femora, a complete obliteration of genu varus defect was not attempted at the tibial osteotomy sites. Postoperatively the phosphatase rose to 60.2 K.-A. units as osteoblastic activity developed at the osteotomy "fracture callus." Three months later it had fallen to 25 K.-A. units with no change in vitamin dosage. The patient was discharged seven months after surgery with complete healing at the osteotomy sites. She was still taking 20,000 units vitamin D (viosterol) daily. The epiphyses showed closure of the epiphyseo-metaphyseal gap, loss of cupping and of the moth-eaten appearance. Moderate flaring was still present.

Case History

D. C., female age 4½ years, was first seen at the Shriners' Hospital for Crippled Children in November 1946 for severe bilateral genu varus and short stature. The patient had weighed 5 pounds, 10 ounces at birth, one month prematurely, the mother having been on prophylactic calcium capsules for the first trimester, liver and iron capsules the remainder of gestation. At six weeks of age the baby was started on sunbaths, orange juice, and Vi Delta codliver oil. She always took her formula well and has enjoyed copious amounts of milk. The infant was precocious, standing early, and walking at age 10 months, by which time the bowleg deformity was sufficiently evident to warrant medical advice. The codliver oil concentrate was increased from 10 to 20 drops daily, more intensive sunbaths prescribed, and a "tonic" given. Although the child's health was radiant, the deformity progressed. She cut her first tooth at 18 months. At age 23 months treatment was undertaken by an orthopedic surgeon with osteotomy of the left tibia, long leg plaster casts bilaterally, and 2 teaspoons daily of U.S.P. codliver oil, her daily medical therapy when seen by us two and one-half years later. Three months after removal of the casts, the deformity was recurring, so they were reapplied. The second course in plaster did not appreciably benefit the patient, nor did a series of chiropractic adjustments (although the latter cured her enuresis). At the time a second orthopedic surgeon was being consulted, arrangements were completed for care at the Shriners' Hospital.

The past medical history, family history, and systemic review were normal.

The patient was a healthy appearing 4½-year-old white female with severe bowing of the legs (Fig. 3). Her height was 38⅝ inches, 3 inches less than the average for her age.

The physical findings of clinical interest were marked fronto-parietal prominence, deciduous teeth in excellent condition, no caries or rachitic stigmata, definite costochondral beading, and Harrison's grooves.

The heart and lungs were normal, the blood pressure 78/54. The abdomen was soft, protruding, with poor muscular tonus, and diastasis of the recti. The gross pathology was in the lower extremities, with a genu varus deformity giving a space of 10.5 cm. between the knees with the medial malleolae touching. The deformity involved the femora and tibiae symmetrically. Generalized epiphyseal flaring was present. No disproportion between length of extremities and of vertebral column was present.

Laboratory studies showed normal routine urinalyses and hemogram. Serum calcium was 11.8 mgm. per cent, serum phosphorus 2.2 mgm. per cent, and alkaline phosphatase 27.3 King-Armstrong units. Total serum proteins were 6.2 gm. per cent. Other diagnostic tests were considered normal, as follows: Kline and Kolmer negative, Mantoux negative, urine Sulkowitch negative, P.S.P. excretion 60 per cent in first hour with 65 per cent in two hours, Hanger's cephalin-cholesterol flocculation zero in 24 and 48 hours, thymol turbidity 1.7 units, intravenous bromsulphthalein retention 4 per cent in 45 minutes, fecal fat 15 per cent of the dry matter with dry matter 35 per cent of the total weight.

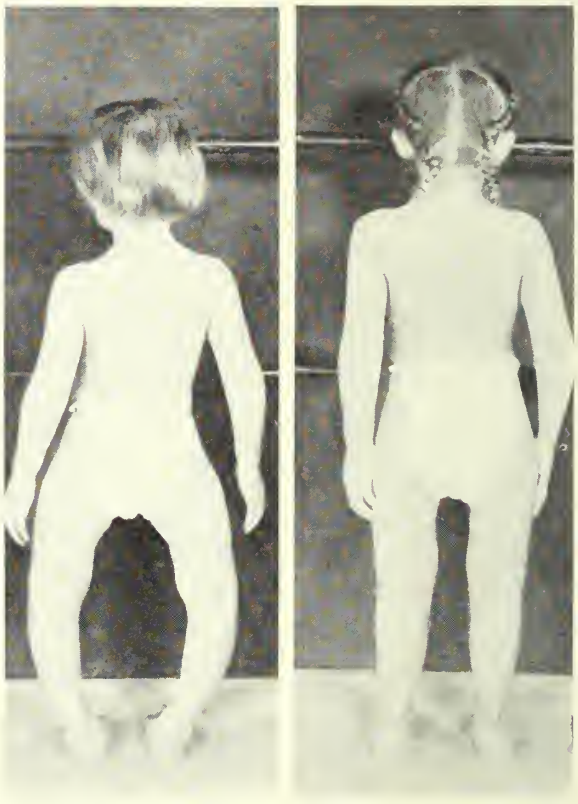


Fig. 3. D. C., age 4 years and 6 months, at admission. Shown also ten months later, after bilateral tibial osteotomies and 20,000 units vitamin D daily.



Fig. 4. D. C., on admission, age 4½ years. Radiographic picture easily mistaken for chondrodysplasia.

Radiographic studies on admission showed the classic epiphyseal changes of active rickets (Fig. 4), with retardation of bone age, three centers being present in the carpus.

Initially a routine dose of vitamin D was administered, 1,000 units, daily, with no visible effect on the epiphyseal changes. After one month, the dosage was increased gradually to 8,000 units daily. This was found sufficient to cause definite radiographic evidence of healing of the rickets (Fig. 5), but the moderate elevation of the alkaline phosphatase was not altered. After four months of observation, the patient underwent bilateral osteotomies of the tibiae and fibulae, a satisfactory correction of the genu varus deformity being attained. Three months later the plaster dressings were removed.

Postoperatively the alkaline phosphatase rose to 44.6 K.-A. units, and it appeared from the radiographs that the rachitic activity was not being fully controlled. Accordingly, the patient was given increasing amounts of viosterol, the dose being stabilized at 2 cc. daily (20,000 units). Healing of the osteotomies and of the epiphyseal dysplasia proceeded uneventfully. During ten months of observation, the serum calcium varied between 10.2 and 12.3 mgm. per cent, the phosphorus between 1.9 and 3.4 mgm. per cent. The patient was discharged from the hospital 6½ months after her surgery, still taking 2 cc. viosterol daily. The functional and cosmetic results appeared excellent.

In closing, let us stress a few observations of clinical interest, from our own, and the experience of others. It appears to be a common tendency for physicians to fail to diagnose clinical rickets merely because the child is on a vitamin D intake which is usually sufficient.



Fig. 5. D. C., after two months on 20,000 units of vitamin D daily. Decrease in metaphyseal beaking, closure of epiphyses —metaphyseal gap, apeparance of lines of "growth arrest," clarification of epiphyseal structures.

This can have a most unfortunate result for the occasional case of resistant rickets. It has been noted that as children grow older, they require increasing doses of vitamin D for curative effects. Eliot and Park state that in even an average case of rickets, an older child may require 60,000 units of vitamin D daily. In these children, the rachitic activity may be of a more "smouldering" nature, and require close radiographic and laboratory supervision to insure adequate therapy. When the active rachitic phase has been arrested, cure may be maintained by a daily intake of vitamin D much less than that required as initial therapy.[1,9,11,31] It is desirable to be sure of the current state of affairs in any "post-rachitic" child presented for orthopedic correction of residual deformities. If the disease is still active, surgical correction of deformity is apt not to give lasting improvement and may even lead to further confusion of the correct diagnosis. The diagnosis of active rickets in an older child by radiographic evidence alone may be made with hesitation by even an expert roentgenologist. It is desirable to have close coordination between the pediatrician, the radiologist, the clinical laboratories, and the orthopedic surgeon to obtain optimum results with a given case of vitamin D resistant rickets.

Summary

1. Attention is called to the group of children with active rickets requiring larger than average doses of vitamin D for curative effects, "massive therapy" in rare cases.

2. The necessity for increased doses of vitamin D is stressed in older rachitic children as a group.

3. Cases of resistant rickets are resistant to the specific biologic activity of vitamin D.

4. The toxic effects of vitamin D are due to excessive action of its therapeutic properties, are not encountered in sub-therapeutic doses even with "massive therapy."

5. Clinical management of resistant rickets is discussed.

6. Two cases of resistant rickets are presented.

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The Treatment of the Recurrent Congenital Club Foot*

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The congenital club foot is probably the most common of all congenital deformities.

The treatment of the congenital club foot is quite successful in most cases if started early in infancy, preferably during the first two weeks of life; if the foot is overcorrected completely; if the post-corrective phase is followed long enough, and if during this latter period, treatment is re-instituted at the first sign of a recurrence.

In spite of this, the recurrent congenital club foot is frequently encountered. These children come to us with varying degrees of deformity. Most of them have deformed rigid feet that defy conservative therapy.

Many types of treatment have been devised for the correction of this recurrent deformity. Not a new treatment, but a combination of some of the more commonly used methods will be presented here.

In treating the club foot at birth, the three major components of the deformity, namely, the adduction of the forefoot, the varus of the heel, and the equinus of the foot are corrected in stages and in that order. The same principle has been applied here except that in addition to plaster or splint correction, surgery has been added. The first stage consists of a mid-tarsal capsolotomy through the talo-navicular joint and in some the naviculo-cuneiform articulation. This procedure is done through a small dorso-medial incision. The capsule and all supportive structures are divided completely, which usually permits correction of the forefoot adduction. No attempt is made to correct the varus of the heel or the equinus of the foot at this time. A plaster dressing is then applied holding the forefoot in the corrected position. This plaster is usually changed twice, at an average interval of five weeks. Each time the plaster is changed, the forefoot is still further corrected, if indicated, by manipulation without anesthesia.

On an average of fifteen weeks, following the medial capsulotomy, the second stage is begun and consists of an Achilles tendon lengthening and a posterior capsolotomy. The Achilles tendon is exposed through a curved medial incision and is divided by means of a Z plasty with the posterior distal half attached to the calcaneus. This provides an excellent exposure of the posterior aspect of the tibia, talus, and calcaneus. The capsule between these structures is divided and the incision is carried forward on both sides as far as possible. This permits correction of the varus of the heel and the equinus of the foot. The Achilles tendon is re-approximated under slight tension while the foot is held in its new position. Before the plaster dressing is applied the forefoot is again manipulated if indicated. This plaster is changed after an average period of five weeks and usually a walking plaster is applied. This final plaster is worn for an average period of five weeks. Following the removal of the plaster, the child is fitted with metal club foot splints to be worn day and night until shoes are provided, and at night and during periods of rest after this. Physical therapy treatments are started as soon as the plasters are removed and consist chiefly of exercises directed toward rehabilitation of the dorsiflexors and evertors of the foot. Most patients show a rather marked weakness of the calf muscles following this form of treatment so exercises for strengthening this muscle group are stressed. Shoes are fitted usually of the Sabel club foot variety. Some receive an ordinary high-top straight last shoe with additional elevations along the lateral border of the sole and heel, the elevation on the sole exceeding that of the heel (Fig. 1).



Fig. 1A. Fig. 1B.

Types of shoes used postoperatively. Fig. 1A—Straight-last shoe with added corrections. Fig. 1B. Sabel type club foot shoe.

These children are dismissed from the hospital after they are able to actively dorsiflex and evert the foot and are approaching a near normal gait. They are sent home with the night splints and instructions for exercising. They return at six-month intervals for observation. After the end of a year, if the deformity has shown no tendency to recur, the night splints are discarded; however, the special shoes are worn for a much longer period.

Since September, 1946, thirteen cases have been treated by this method. Eight, or 61.5 per cent, were males; five, or 38.5 per cent, were females. The oldest was 10 years, the youngest 4 years, with an average age of 7 years (Table 1). Eight cases were bilateral, in six of which both feet were treated, and in two of which only the left foot required treatment. Five cases were unilateral; of these the left foot was involved in four, and the right foot in one (Table 1). The average hospital stay for twelve cases was 34 weeks; one patient is

*From the records of The Shriners Hospital, Minneapolis, Minnesota.

TABLE 1

Case No.	Date of Admission	Sex	Age	Unilateral	Bilateral	Time Interval: Med. Cap to Post. Cap.	Time Interval: Post. Cap. to Plaster off	Time Interval: Plaster off to Discharge	Result	Follow-up
1.	11-12-46	F	7		x	18 wks.	18 wks.	9 wks.	Excellent position	12 mos. No recurrence
2.	5-18-48	M	6	Left		7 wks.	9 wks.	4 wks.	Good position	None
3.	6-3-47	M	10		x	14 wks.	11 wks.	2 wks.	Improved	6 mos. No recurrence
4.	6-10-47	M	5		x	15 wks.	18 wks.	7 wks.	Improved	5 mos. No recurrence
5.	7-22-47	M	4		x	15 wks.	11 wks.	11 wks.	Good position	3 mos. No recurrence
6.	7-15-47	F	8	Right		10 wks.	14 wks.	6 wks.	Good position	6 mos. No recurrence
7.	6-10-47	F	6		x	14 wks.	11 wks.	10 wks.	Good position	8 mos. No recurrence
8.	6-17-47	F	5		x	12 wks.	11 wks.	6 wks.	Good position	9 mos. No recurrence
9.	10-1-46	M	8	Left		34 wks.	5 wks.	3 wks.	Excellent position	6 mos. No recurrence
10.	9-3-46	M	8	Left		30 wks.	7 wks.	2 wks.	Excellent position	6 mos. No recurrence
11.	11-4-47	F	8		x	9 wks.	7 wks.	7 wks.	Improved	None
12.	8-19-47	M	7		x	9 wks.	9 wks.	5 wks.	Good position	6 mos. No recurrence
13.	2-3-48	M	9	Left		9 wks.	7 wks.		Good position	Still in Hospital
					Average	15 wks.	10 wks.	6 wks.		6½ mos.

still in the hospital. Ten of the patients dismissed from the hospital have been seen in the out-patient department at an average interval of six and one-half months, the longest follow-up period being twelve months. Two patients were dismissed too recently to have returned to the out-patient department.

Following treatment, the result has been uniformly good with all the feet showing good weight-bearing position, and in practically every case active overcorrection of the deformity has been possible. To date there has been no recurrence of the deformity in the ten cases seen in the out-patient department and in the one patient still in the hospital (Table 1).

Several cases will be presented to illustrate the typical deformity, the problems encountered, and the results obtained by this method.

Case 1. A girl, 7 years old, was admitted to the hospital for the first time on January 30, 1940, at the age of 3 months, with a severe bilateral club foot. She was treated with the Denis Browne splint until April 10, 1940, and then with plasters until May 8, 1940. This was followed by physical therapy until her dismissal on October 23, 1940. At this time the deformity had apparently been corrected for she was seen in the out-patient department on February 25, 1941, and at this time the feet were still in good position. In 1943, at the age of 4 years, she wore plasters again for one month. After February, 1941, she was not seen until November 12, 1946, when she was admitted with a severe bilateral recurrent deformity (Fig. 2A, 2C, 2E). On January 16, 1947, a mid-tarsal capsolotomy was done through the right talo-navicular and naviculo-cuneiform articulation, and on February 6, 1947, a similar procedure was done on the left foot. On May 22, 1947, bilateral posterior capsolotomies were done. She was dismissed from the hospital on September 24, 1947, wearing a straight last shoe with ⅜ inch elevation on the outer border of the sole and ⅛ inch elevation on the outer border of the heel. At the time of dismissal the feet were in excellent position and she was able to actively overcorrect (Fig. 2B, 2D, 2F). She was last seen in the out-patient department on September 21, 1948, with no evidence of any recurrence.



Fig. 2A. Fig. 2B.



Fig. 2C. Fig. 2D.

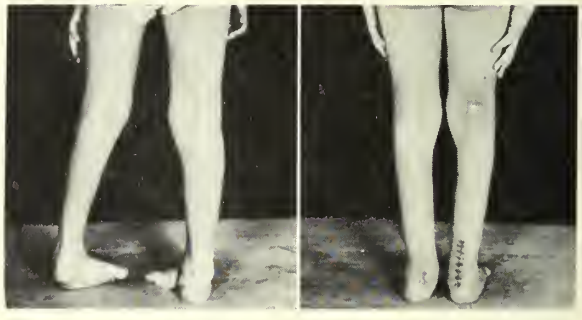


Fig. 2E. Fig. 2F.

Case 1. L. S., Female, age 7 years. Fig. 2A and 2B, front view, before and after treatment. Fig. 2C and 2D, plantar view, before and after treatment. Fig. 2E and 2F, rear view, before and after treatment.

Case 2. A boy, 6 years of age, who was treated at birth for a left club foot with splints and manipulations. Plaster correction was started at the age of one month but the foot was never completely corrected by this method according to the history obtained. He was admitted to the hospital on November 5, 1946, at the age of 4 years. In December, 1946, the foot was wrenched and an external rotation osteotomy of the tibia was performed. He was not seen again until May 18, 1948, when he was admitted with a severe rigid left club foot (Fig. 3A, 3C, 3E). On May 20, 1948, a mid-tarsal capsolotomy was done through the talo-navicular and naviculo-cuneiform articulations. On July 8, 1948, a posterior capsolotomy was done and the patient was discharged from the hospital on October 5, 1948, wearing a Sabel club foot shoe on the left. At the time of dismissal the foot had been completely corrected. He has not returned since that date.

Case 4. A boy, 5 years of age, whose treatment had been started at the age of 6 weeks and who for seven months had been treated by means of manipulations and plasters. He had no further treatment until 1944, at the age of 2 years, when bilateral fasciotomies, Achilles tendon lengthenings, posterior capsolotomies and posterior tibial tenotomies were done. He was admitted to the hospital on June 10, 1947, with bilateral rigid club feet with a marked forefoot adduction(Fig. 4A, 4C, 4E). On June 19, 1947, bilateral mid-tarsal capsolotomies were done through the talo-navicular joints, and on October 2, 1947, posterior capsolotomies were done. He was dismissed from the hospital on March 28, 1948, wearing Sabel shoes. At this time there was marked improvement of the position of the feet (Fig. 4B, 4D, 4F). He was last seen in the out-patient department on August 31, 1948, and at this time the feet were easily



Fig. 3A. Fig. 3B.



Fig. 3C. Fig. 3D.

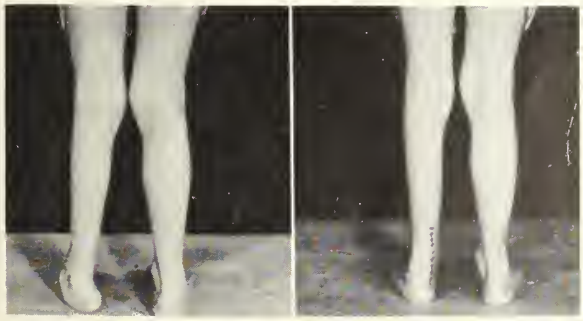


Fig. 3E. Fig. 3F.

Case 2. R. M., Male, age 6 years. Fig. 3A and 3B, front view, before and after treatment. Fig. 3C and 3D, plantar view, before and after treatment. Fig. 3E and 3F, rear view, before and after treatment.

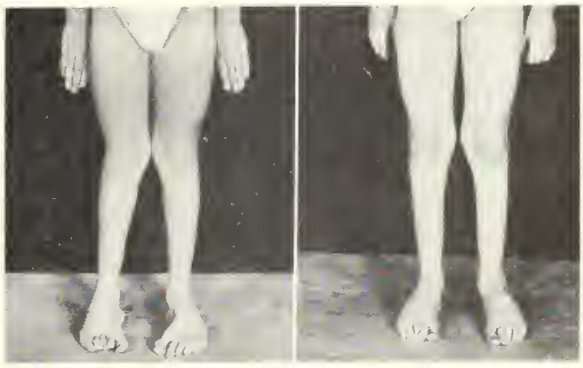


Fig. 4A. Fig. 4B.



Fig. 4C. Fig. 4D.



Fig. 4E. Fig. 4F.

Case 4. W. B., Male, age 5 years. Fig. 4A and 4B, front view, before and after treatment. Fig. 4C and 4D, plantar view, before and after treatment. Fig. 4E and 4F, rear view, before and after treatment.



Fig. 5A.



Fig. 5B.



Fig. 5C. Fig. 5D.

Case 11. B. S., Female, age 8 years. Fig. 5A and 5B, dorsiplantar x-ray of left foot before and after treatment. Note deformity of the navicular. Fig. 5C and 5D, lateral x-ray of left foot before and after treatment.



Fig. 6A. Fig. 6B.

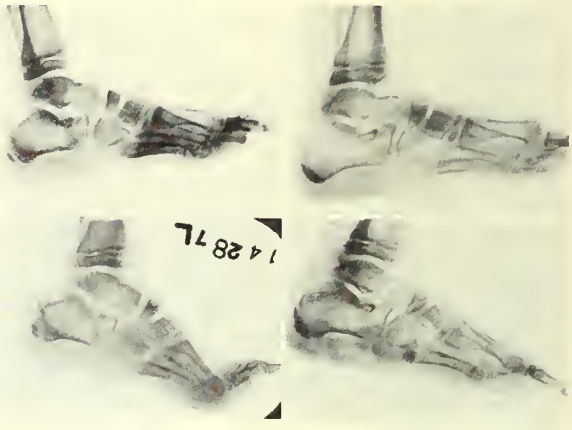


Fig. 6C. Fig. 6D.

Case 8. B. L., Female, age 5 years. Fig. 6A and 6B, dorsiplantar x-ray of both feet before and after treatment. Note the normal relationship between the talus and navicular and between the talus and calcaneus in Fig. 6B. Fig. 6C and 6D, lateral x-ray of both feet before and after treatment. Note the improvement in the angle between the tibia and calcaneus.

overcorrected and loose. There was still moderate weakness of the calf muscles, but no evidence of any recurrence of the deformity.

Discussion

It is quite evident from the foregoing that all these children had severe deformities, that in nearly every case treatment had not been constant from the time of birth, and that in many there had been long intervals without treatment. Ten of the patients had had previous surgery of some type, one even had had a triple arthrodesis (Case 13), and three had had at least one wrenching. These factors of course made the present problem more difficult. In several, structural changes had occurred in the foot (Fig. 5A-D). These feet can be corrected by this method as illustrated in Fig. 6A-D. Motion in the foot and ankle is by no means normal, but the weight-bearing position of the foot is good and these children are able to walk with comfort. These children have not been followed long enough to be certain of no recurrence, but indications would point to a maintenance of the correction.

Acute Bacterial Meningitis

Review of Therapy in 198 Cases at the Minneapolis General Hospital

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A review of the records at the Minneapolis General Hospital for the years 1922-1936, 1937-1943, and 1943-July 1947 indicates a progressive increase of bacterial infections complicated by meningitis (Table 1). This rise in incidence of meningitis among the civilian population is of considerable significance in the face of statistical evidence of a reduction in the rate of other bacterial infections among the populace for the same period. Further analysis of these records and perusal of the literature reveals marked differences of opinion concerning the management of bacterial meningitis.

The purpose of this communication is to re-evaluate diagnostic and therapeutic measures in the light of current literature and to present a routine of diagnostic and therapeutic procedures based upon our experience and that of the majority of investigators as expressed in recent literature. Inasmuch as the meningococcus, pneumococcus, and the hemophilus influenzal bacillus were the etiological agents in over 85 per cent of our cases and since these organisms seem to have a specific affinity for the meninges, in contrast to the meningeal invasion by other bacteria which usually occurs as a result of an accidental generalized diffusion of the organism, this discussion will be limited to the three types mentioned.

Table 1

Comparative Statistics of Different Types of Meningitis Observed at Minneapolis General Hospital the last 25 years.

Etiology	1922–1936		1936–1942		1943–1947		
	No. Cases	Deaths	No. Cases	Deaths	No. Cases		Deaths*
Meningococcus	240	92	34	5	123	17	4
Pneumococcus	85	85	20	17	26	13	10**
Hemophilus Influenzae	17	17	6	4	21	7	3
Streptococcus	137	135	13	3	9	4	1**
Staphylococcus	15	15	3	1	2	0	0
Mycobacterium Tuberculosis					6	6	6

*Excluding cases died within 18 hours after admission. **Excluding cases receiving no treatment.

Discussion

It has been pointed out by Herrick,[1] Hill [2] and others that the organisms causing meningitis reach the meninges by way of the blood stream. The occasional direct implantation following trauma, or direct extension from oto-rhinogenic foci is conceivable although Burman [3] and others contend that most cases of meningitis are secondary to a bacteremia, and that even oto-rhinogenic meningitis results from the entrance of the bacteria into the blood stream.

Intense invasion of the blood stream by pyogenic organisms may be accomplished either by direct pouring in from an infected lymph channel, vein wall, or heart valve, or may be disseminated by means of infected emboli extending from small thrombosed vessels. In meningococcic invasion, however, the extraordinary degree of blood stream infection which is so often observed does not suggest such means of implantation and is thought to result by invasion of the blood stream from minute foci in the upper air passages.[4]

By means of microscopic sections of petechiae, Brown [5] clearly demonstrates evidence of damage to the arteriolar and capillary walls resulting in loss of integrity of the vessel walls. This is paralleled by the early pathologic changes in the meninges.[4] The conclusion, therefore, that a liberated toxin effects vascular damage permitting ready access of the organism to the vascular stream and its escape to the meninges is inescapable.

Further evidence of diffuse vascular damage was recently demonstrated by Hill and Kinney [2] in a report on the cutaneous lesion in 25 fatal cases of acute meningococcemia. The widespread vascular damage was not limited to the skin but was observed throughout the serous surfaces and other organs of the body.

These authors show decided endothelial changes in the smaller vessels and capillaries often to such a degree that the continuity of the lining endothelium was broken. Furthermore, meningococci could be identified in the endothelial cells. On the basis of this report, it is evident that the cutaneous lesion can be explained by vascular damage resulting from the presence of meningococci. The sequence of events in the pathogenesis of the lesion being the localization of the organism in the endo-

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thelium followed by endothelial damage and inflammation of the vessel walls resulting in necrosis and thrombosis.

As stated by Lange, et al.,[6] increase in capillary permeability is one of the basic processes of the functional pathology in inflammation, a phenomenon demonstrated in the past by diffusion of dyes. These investigators in a study involving 149 patients demonstrated a decided increase of fluorescein in the spinal fluid of patients with bacterial meningitis as compared to the normal.

However, the same principle apparently does not pertain to the diffusion of penicillin. Rammelkamp and Keefer[7] were unable to demonstrate the excretion of penicillin in the spinal fluid when the drug was administered in large doses by intramuscular and intravenous routes. Rosenberg and Sylvester,[8] on the other hand, demonstrated adequate levels of penicillin in the spinal fluid of eight patients treated with parenteral penicillin. Of these, two cases received the drug intramuscularly and six intravenously. The apparent difference is probably due to the fact that the former group studied non-infected individuals whereas the latter investigated patients with meningeal infections.

Subsequently Kinsman and Alonzo[9] in a study involving 36 cases demonstrated no penicillin in the spinal fluid of 20 patients without meningeal involvement nor in five cases of meningococcemia without evidence of meningitis. In 11 patients with bacterial meningitis treated with penicillin extrathecally, the appearance of the drug in the spinal fluid was irregular, inconstant, and in concentration considered inadequate for bactericidal effect.

Hirsch and Lowe[10] demonstrated that the circulation in some infected and non-infected thrombophlebitis can be re-established by the use of anti-coagulants. Since there is an increase in capillary permeability which may be variable with the extent of break-down of the blood brain barrier, is it reasonable to assume that this break-down could be enhanced by artificial means, presumably thereby facilitating the effect of chemotherapeutic and antibiotic agents on the capillary bed and their diffusion into the cerebrospinal system?

The intrathecal administration of heparin has been successfully reported in a few cases of chronic meningitis by Platou and Gibbs,[11] Alexander,[12] and Ross.[13] From the evidence presented above, extrathecal heparinization or dicoumeralization of the patient with meningitis might be a tenable subject for further study and investigation.

It has been shown[14] that the rise in anti-carbohydrate antibody in pneumonia correlates with the crisis whether spontaneous or induced and that immunity to meningococcic infection as well as ability to withstand infection is closely related to age.[15] It is also well known that a definite lack of immunity to pneumococcus exists in the infant up to two years of age.[16] This has been well demonstrated by the failure to elicit significant antibody response by immunization against type 1 pneumococcus in children under two years of age, whereas children over two showed a sharp rise in antibody titre.[17] Similarly the blood of children between two months and three years of age has been found to have no antibodies against the hemophilus influenzal bacillus.[18]

Regardless of the source, whether fabricated by the host or passively induced, antibody plays an essential part in the recovery mechanism. The immunologic response is largely responsible for the better results in the young adult groups, regardless of treatment, as compared to the extreme age groups whose facilities for fabricating antibodies is known to be poor.

The meningococcus, pneumococcus, and hemophilus influenzal bacillus which are responsible for the vast majority of bacterial meningitis constitute an immunological group.[14] Each of these organisms is surrounded by a capsule containing a specific carbohydrate which is released and diffuses into the surrounding media. This capsular substance is the element of the organism upon which its specificity and power to invade the host depends. The quantity of free capsular carbohydrate is an index of the severity of the infection and may serve as a guide as to the amount of specific antibody necessary for neutralization and recovery. The free capsular carbohydrate must be inactivated before the substance in the capsule of the organism can be affected. Since this free substance is excreted in the urine, diuresis by means of parenteral administration of fluids prior to the administration of the specific anticarbohydrate is beneficial. It is also conceivable that forced excretion of the free capsule carbohydrate may prevent a violent antibody antigen combination which probably contributes to the high incidence of fatalities in fulminating cases.

In mild infection, interference with the growth and metabolism of the invading organism by chemotherapy is sufficient to allow the natural antibody response to overcome the infection. Free antibody can be detected earlier in the course of a disease when chemotherapy is instituted than in those not so treated. There apparently is an interference with the metabolism of the organism resulting in less antigen or specific carbohydrate liberation. The evidence indicates that the anticarbohydrate antibody is the protective antibody in hemophilus influenzae, penumococcic and meningococcic infections.[12]

The invasive power of the meningococcus, pneumococcus, and influenzal bacillus varies with different types. Mitman[19] is of the opinion that the virulence is more concerned with epidemic strain than with any particular type and is reflected in the wide variations in the fatality rate between one epidemic and another as well as epidemic and endemic cases. The variations in mortality rates of the various epidemics and indeed in groups of patients in the same epidemic may therefore be closely related to the type of strain of the prevalent organism. It is well known[20] that group I meningococcus account for the vast majority of epidemic cases and group II is responsible for the sporadic cases, the carriers, and the disease in the extremes of life.

It is commonly accepted[21-25] that early diagnosis and therapy is of paramount importance. However, early diagnosis is particularly difficult in the extremes of life. Consequently the high death rate in these groups may

not only be the result of poor immunological response but may to a large measure be influenced by the late diagnosis because of the bizarre clinical picture and the absence of the classical findings. The combination of favorable factors such as ideal age group, early diagnosis, and early treatment, may account for the excellent results reported during the war.[26-28]

The significance of diagnosis prior to distinguishable meningeal involvement lies in the speed with which the infection can be brought to an end by the early administration of sulfonamides or antibiotics in therapeutic doses.[29] The apparent incongruity appearing in the 1944 Scottish report in which it was noted that patients with the shortest duration of symptoms had a higher fatality rate, merely serves to emphasize the familiar observation of the rapidity of invasion in fulminating forms of this disease. Certainly the report does not intend or justify a delay in treatment.

Data

During the period covered by this communication, 198 cases of meningitis were admitted to the Minneapolis General Hospital (Table 2). Of these, 123 were due to the meningococcus, 26 to the pneumococcus, and 21 were caused by the hemophilus influenzal bacillus. Of the remaining 28, 10 were unidentified bacteriologically, although from the history, mode of onset, and clinical response, they could readily be classified as meningococcic. Of the other 18, six were caused by the mycobacterium tuberculosis, nine of hemolytic streptococcus, two by staphylococcus aureus and one as a result of invasion by the Escherichia coli bacillus.

Meningococcic meningitis was observed in all age groups (Table 3). The youngest patient was seven weeks old and the oldest 74 years of age.

Although there were scattered cases of pneumococcic meningitis among the various age groups, by far the greatest number occurred in the adults. Only six of the total reported were observed in the child age group.

Table 2

Incidence, Mortality and Corrected Mortality of Bacterial Meningitis Observed at Minneapolis General Hospital from January 1943 to June 1947.

Etiology	No. Cases	Deaths	*Corrected Deaths
Meningococcus	123	17	4
Pneumococcus	26	13	11–10**
Hemophilus Influenzae	21	7	3
Mycobacterium Tuberculosis	6	6	6
Staphylococcus	2	0	0
Streptococcus	9	4	4–1**
Escherichia coli	1	1	1
Undetermined	10	1	1
Total	198	49	30–26**

*Excluding cases died within 18 hours after admission.
**Excluding cases receiving no therapy.

In contrast, the hemophilus influenzal bacillus showed a decided predilection for the very young. All the cases of meningitis caused by this organism occurred in young children, the oldest being seven years of age. Eighteen of the twenty-one cases observed, however, were in children under five years of age and eleven of these were in infants under two.

The seasonal incidence (Fig. 1, page 184) correlates closely to the season of the year when infections are most prevalent. This observation has been noted in numerous reports in the past and was especially well demonstrated during the epidemic of bacterial meningitis among the military personnel in the last war.[30]

The over-all mortality rate for this series compares favorably with recent reports appearing in the literature,[31-37] and comparing these statistics with previous studies from this institution [38,39] there is noted a considerable decline in the fatality rate in all forms of bacterial meningitis with the exception of the tuberculous variety.

Table 3

Incidence and Deaths of Bacterial Meningitis Observed in Various Age Groups.

Age / Etiology	0–12 mo.		1–2 yrs.		2–5 yrs.		5–10 yrs.		10–20 yrs.		20–40 yrs.		40–60 yrs.		60–77 yrs.		Total	
	No.	Died	No.	Died	No.	Died	No.	Died	No.	Died	No.	Died	No.	Died	No.	Died	No.	Died
Meningococcus	13	3 (2)*	9	3 (3)*	14	2 (1)*	16	2 (1)*	15	1 (1)*	28	4 (4)*	22	2 (1)*	6		123	17 (13)*
Pneumococcus	1	1	3	1	0		1		1		3	1 (1)*	11	4 (1)†	6	6 (1)*	26 (2)*	13 (1)†
Hemophilus	8	4 (3)*	3	1	7		3	2 (1)*	0		0		0		0		21	7 (4)*
Myco. Tuberc.	0		1	1	0		1	1	3	3	0		1	1	0		6	6
Staphylococcus	0		0		0		0		0		1		0		1		2	
Streptococcus	0		0		0		1		1		4	4 (3)†	2		1		9	4 (3)†
Escherichia coli	1	1	0		0		0		0		0		0		0		1	1
Undetermined	2		0		1		1		1		2		2		1	1	10	1
Total	25	9 (5)*	16	6 (3)*	22	2 (1)*	23	5 (2)*	21	4 (1)*	38	9 (5)* (3)†	38	7 (1)* (1)†	15	7 (1)*	198	49 (19)* (4)†

*Expired in less than 18 hours. †Received no specific therapy.

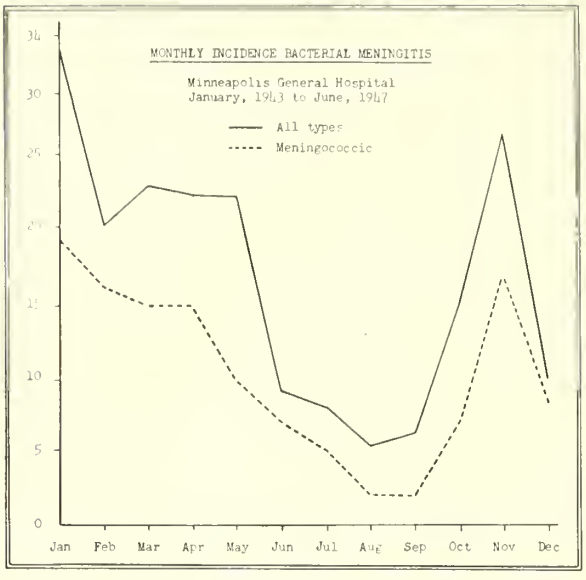


Fig. 1.

A significant and encouraging reduction in the fatality rate is noted in meningeal infections caused by pneumococcic, streptococcic and hemophilus influenzae bacillus. As can be expected, the mortality was highest in the extreme age groups, although it is gratifying that of 22 cases of meningococcic meningitis in children under two years of age, there were only six fatalities. Justifiably excluding the cases that expired in less than nine hours following admission, there resulted only one death in 17 cases of meningococcic meningitis in the infant group. Although the fallacy of comparing statistical data is well recognized, there can be little doubt that these encouraging results are actual and were probably influenced in no small measure by the chemotherapeutic and antibiotic agents.

Table 4 indicates the type of treatment employed. Either sulfonamides or penicillin or a combination of the two was employed in 71 cases of meningococcic meningitis with a total of seven fatalities. All seven, however, expired shortly after admission and can justifiably be excluded in the records of corrected mortality. Fifty cases were treated with sulfonamides plus antitoxin or sulfonamide plus penicillin plus antitoxin. In this group there was a total of eight deaths. Excluding those cases that expired within 18 hours after admission, there remained four deaths in 46 cases of meningococcic meningitis treated in this manner. It would seem that the most satisfactory results in meningococcic meningitis were obtained with sulfonamide and penicillin therapy. The poorer results with antitoxin treatment in conjunction with chemotherapy may, however, be explained by the fact that antitoxin was administered to the more seriously ill and fulminating cases or its use was resorted to when the patient failed to improve with the chemotherapeutic and antibiotic agents.

Intense infection as evidenced by numerous organisms in the cerebrospinal fluid, marked pleocytosis, and markedly reduced spinal fluid sugar unfavorably influenced the prognosis. Delay in treatment accounted for most of the prognosticated fatalities.

TREATMENT

From Table 4 it is readily obvious that there was a considerable variation in the specific management of bacterial meningitis. This again merely serves to emphasize the state of uncertainty and disagreement found in recent literature concerning the management of this infection. Accordingly it is believed advisable to present a routine of diagnostic aids and therapeutic measures based upon our own experience and on the consensus of the majority of investigators as reported in recent literature. It must be recognized, however, that the recommended routine is merely a working guide for the usual acute meningeal infection and is not inviolate.

General Management

1. Draw a specimen for blood culture.

2. Take nose and throat cultures for predominant organisms.

3. Perform a diagnostic lumbar puncture and examine for (a) cell count and differential, (b) smear, (c) culture, (d) sugar, (e) protein, (f) chlorides, (g) pellicle formation.

TABLE 4

Treatment employed in 198 Cases of Bacterial Meningitis. Serum was employed only for the Hemophilus Influenzae Meningitis.

Treatment	Meningococcus			Pneumococcus			Hemophil. Influenzae			Staphylococcus			Streptococcus			Mycobact. Tuberc.			Undetermined		
	NO.	D.	D.*	NO.	D.	D.*	NO.	D.	D.*	NO.	D.	D.*	NO.	D.	D.*	NO.	D.	D.*	NO.	D.	D.*
Sulfonamides	13	4	0	2	2	1	1	0	0				3	1	1				3	0	0
Sulfonamides and Serum or A.T.	38	4	1	6	3	3	6**	2	1										2	0	0
Penicillin	1	1	0	1	1	1										1	1	1			
Penicillin and Sulfonamides	57	2	0	10	4	4	3	2	0	2	0	0	3	0	0	2	2	2	4	1	1
Penicillin, Sulfonamides, Serum or A.T.	12	4	3	4	0	0	5**	2	2												
Penicillin, Sulfonamides, Serum and Streptomycin							6**	1	0							2	2	2			
No treatment	2	2	0	3	3	2							3	3	3	1	1	1			

*Excluding cases expired within 18 hours of admission. **Alexander's Anti-Hemo Type B Rabbit Serum.

4. Start an intravenous infusion of 1/6 M. lactate in 5 per cent glucose in quantities calculated to adequately hydrate the patient.

5. Follow this infusion with sulfadiazine in 1:5 per cent solution and give one-half the calculated dose to raise the blood level rapidly to approximately 20 mgm. per cent. The remainder of the dose is administered orally in divided doses every four hours. If the patient is comatose or does not tolerate oral medication, the drug may be administered subcutaneously or intravenously every six to eight hours.

6. Further treatment depends upon the organism involved. This will usually be confirmed bacteriologically in most instances by the time the procedures outlined above have been completed.

Meningococcic Meningitis

1. Continue the administration of sulfadiazine in adequate doses orally if tolerated, parenterally if the oral route is not feasible. Maintain a blood level of 20 mgm. per cent for at least ten days after the patient becomes afebrile.

2. Continue penicillin for approximately seven days after the patient is afebrile.

3. Draw a daily blood sulfonamide level to determine the adequacy of the chemotherapy.

4. Observe the patient closely for evidence of toxicity to the drugs by performing daily urinalysis and repeated blood counts.

5. Maintain adequate fluid intake and assure good urinary output by use of parenteral fluids consisting of glucose, Ringer's solution, or saline as indicated.

6. Provide a nutritious well-balanced diet, including supplementary vitamins.

7. Resort to repeated small blood transfusions if anemia is noted or as dictated by the general condition of the patient.

Comment: The authors fully agree with Hoyne and others who advocate only one diagnostic lumbar tap in the usual case of meningococcic meningitis.

Sulfadiazine is the drug of choice for this type of meningeal infection. Although some writers are of the opinion [21] that low sulfonamide levels are equally as effective, Meacham [40] states emphatically that high sustained levels are desirable and important. Oftentimes, due to the rapid and over-zealous administration of the drug, much higher levels were obtained. However, the only consequence observed was a microscopic hematuria and on occasion gross hematuria. The presence of this complication did not affect the treatment but measures were taken to assure good fluid intake and urinary output. It is believed that if an optimum urinary output can be maintained, little harm will result from the hematuria. Hoyne [34] reports levels of over 100 mgm. per cent without any untoward effect. Probably the early administration of 1/6 m. lactate minimizes the toxic effects of sulfonamides.

A number of investigators [41-43] are of the opinion that penicillin alone will control this type of meningitis. However, Mead, et al.,[44] as well as Thomas and Dingle [45] demonstrated the much greater susceptibility of the meningococcus to the sulfonamides. Nevertheless, intramuscular penicillin as an adjuvant is recommended. The intrathecal administration of this drug is not indiccated and is not recommended as a routine.

Although the Council on Pharmacy [46] discredits its value, there are some who still believe that chemo-serotherapy is superior to chemotherapy alone. The use of serum is not advocated but if it is to be used, it should be given in massive doses by the intravenous route and never used intrathecally. Meningococcic antitoxin, if used, must also be given in large doses intravenously. It may be of some value in cases occurring in the extremes of life.

The value of heparin and intrathecal air is debatable at the present and its use must be governed by evidence of block or chronicity. It is a plausible assumption, however, that further clotting may be prevented and fine adhesions may be broken by this means, thereby exposing pocketed organisms to the bacterioacidal agents.

Pneumococcic Meningitis

The same general measures as outlined under meningococcic meningitis pertain to this type as well. However, the drug of choice in pneumococcic meningitis is penicillin administered intramuscularly.

1. This is the only form of meningitis in which intrathecal penicillin might be considered in well diluted doses not to exceed 10,000 units daily.

2. Continue massive doses of intramuscular penicillin until two weeks of normal course has prevailed.

3. Prescribe sulfadiazine to maintain a level of 15 to 20 mgm. per cent for approximately 10 to 14 days.

4. Eradicate surgically any accessible focus of infection.

5. Maintain fluid intake and continue supportive measures as outlined under meningococcic meningitis.

6. If available, type specific rabbit anti-serum may be given intravenously. The reader is cautioned to test for sensitivity prior to administration of the serum. Intrathecal complement (3 to 5 cc. fresh blood serum) is recommended by some authors.

7. Infants—"Prophylactic" intrathecal Heparin 1 to 2 cc. plus air for one or two days cautiously.

Comment: The most favorable results in the treatment of pneumococcic meningitis during the period covered by this report was obtained with the use of penicillin by intrathecal and parenteral routes. The experience of Ross and others supports this view. However, it is of equal importance to maintain a high blood penicillin level as well as adequate concentration of the drug in the cerebrospinal fluid in order to control the bacteremia and to enhance the eradication of foci of infection.

Recurrence of this infection was not uncommon in our experience and in all instances was directly related to early cessation of intrathecal penicillin. One 54-year-old male patient suffered two relapses within a period of 18 days. Ultimately the infection was controlled by resumption of daily intrathecal penicillin for ten successive days and intramuscular penicillin as well as oral sulfadiazine for an additional two weeks.

Recent reports [47,48] stress the danger of residual central nervous system damage as a result of too vigorous intrathecal penicillin therapy. These complications can be prevented by observing slow introduction of a diluted solution containing not more than 1,000 units penicillin per cubic centimeter of diluent and not to exceed a total dose of 10,000 units. There are some who advocate that large intravenous doses of penicillin twice a day will result in adequate levels in the spinal fluid and thus invalidate the intrathecal route.

It is noteworthy that a focus of infection was demonstrated in 18 of the 26 cases here reported and that a fracture of the skull was found in three additional cases. Similar incidence of foci of infection and the presence of skull fracture in this type of meningitis has been reported by others.[13-16]

Hemophilus Influenzal Meningitis

The general procedures outlined above are applicable to this type of meningitis as well. However, inasmuch as this infection is peculiar to the young infant and to the child age group, the need for early and vigorous treatment is urgent. Accordingly the following procedures are recommended.

1. Start a slow intravenous infusion of Alexander's anti-hemophilus type B rabbit serum diluted in Ringer's solution following routine testing for sensitivity. The amount of serum in mgm. available nitrogen is determined by the spinal fluid sugar level as outlined by Alexander.

2. Continue sulfadiazine by whichever route is most practicable and in doses to maintain a blood level of 20 mgm. per cent. Chemotherapy must be continued for about three weeks after the spinal fluid becomes negative or the patient's temperature has returned to normal.

3. Twelve to twenty-four hours after administration of the serum, draw a blood specimen and examine the serum for evidence of capsular swelling of the organism by the patient's serum diluted 1:10. Failure to produce swelling indicates a lack of antibody and therefore additional rabbit serum must be given.

4. In critical cases perform a daily lumbar tap and instill streptomycin in doses of 25 to 35 mgm. for three days. Prescribe streptomycin in divided doses, totaling 1.5 to 2 grams daily not to exceed five days.

5. Supportive measures as indicated for other types must be continued.

6. Heparin and air intrathecally can be considered in special cases.

Comment: Since the introduction of streptomycin there have been reports [49] that this antibiotic agent in itself will control hemophilus influenzal meningitis. However, in view of the seriousness of this infection and its predilection for the very young age groups, it is recommended that all available measures be employed. Prolonged use of streptomycin may be dangerous.

Discussion

Notwithstanding our present-day knowledge of the pathogenesis of bacterial meningitis, the biologic characteristics of the organism, and the changes produced, there are still a number of controversial problems with which one is faced concerning the practical aspects of treatment. Among these are the value of passively induced antibodies, the use of heparin, the choice of chemotherapeutic or antibiotic, or both, agents, and a method of administration of the drugs of choice.

Until the discovery of the sulfonamides, meningeal infections regardless of the etiological agent, were treated with anti-meningococcic serum from the time it first became available in 1907 and until Ferrys antitoxin became popularized. The results for that era were discouraging. However, abandonment of intrathecal administration of serum and substituting massive doses of serum or antitoxin intravenously as suggested by Herrick and later popularized by Hoyne, resulted in a precipitous drop in the fatality rate approximating that later reported in some series treated with sulfonamides.

Nevertheless, since sulfonamide therapy was introduced and clarified, there has been a noticeable decline in the fatality rate of meningococcic and streptococcic meningitis. The death rate for the pneumococcic type has also been lowered but to a lesser degree with the advent of penicillin. The mortality rate of meningitis caused by the hemophilus influenzal bacillus has been reduced from over 90 per cent to less than 20 per cent by means of the sulfonamides, Alexander's serum, and streptomycin.

Summary

1. 198 cases of meningitis observed over a 4½ year period at the Minneapolis General Hospital are reviewed. The meningococcus, pneumococcus, and hemophilus influenzal bacillus were the etiological agents in over 85 per cent of the cases.

2. The most favorable result with the meningococcic infection was obtained by the use of sulfadiazine and penicillin. The pneumococcic infection responded best to penicillin intrathecally and intramuscularly as well as sulfadiazine. Meningeal infection caused by the hemophilus influenzae bacillus was controlled by combined sulfadiazine, Alexander's antihemophilus, rabbit serum and streptomycin.

3. A diagnostic and therapeutic routine for these three types of meningitis is outlined.

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The Serum Amylase Levels in Mumps

Lee Bass, M.D., and Robert B. Tudor, M.D.
Bismarck, North Dakota

MUMPS is a contagious disease characterized by swelling of the parotid and sometimes of the other salivary glands.[1] The constitutional symptoms are usually mild. Evidence points to a filterable virus as the etiologic factor.[2] The total incidence of complications at Charity Hospital, New Orleans, over a recent five-year period was found to be about 25 per cent. These complications almost always occur after puberty.[3]

The determination of the serum amylase [4] offers a convenient method of substantiating a diagnosis of mumps, especially during epidemics when many atypical cases may be expected to occur. It is known that mumps and meningo-encephalitis may occur without any parotid swelling. It seems reasonable to assume that other complications, such as pancreatitis, might follow the same pattern.

In Table 1 are the serum amylase levels of 15 patients with parotid or submaxillary swellings. In Table 2 are the serum amylase levels of 12 patients who for one reason or another were suspected to have mumps but whose serum amylase levels were normal. In Table 3 are the serum amylase levels of two patients, one of whom developed meningo-encephalitis during a mumps epidemic. The other had abdominal pain and tenderness and vomiting which were consistent with a diagnosis of pancreatitis.

Serum amylase values of 300 mg. per cent reducing substance or over are probably elevated.

TABLE 1

Age in Years	Temperature	Swelling	Serum Amylase Levels
3.7	38.0°	Right parotid	1600
5.7	38.0°	Bilateral parotid Right otitis media	760
7.2	37.2°	Right parotid, right submaxillary	1032
7.6	37.6°	Submaxillary 8 days after parotid	940
4.10	38.2°	Right parotid	993
4.4	37.2°	Palpable parotid	878
8.1	37.2°	Post mumps 2 wks. right submaxillary	335
1.0	37.7°	Mumps contact	400
7.8	37.4°	Left parotid	355
1.10	39.7°	Bilateral parotid	430
1.3	40.4°	Palpable parotid	960
5.5	37.4°	Bilateral parotid	2285
6.10	38.6°	Submaxillary	500
6.5	38.0°	Both parotid	2043
6.0	37.7°	Submaxillary 2 days after parotid swelling	1715

SUMMARY

Serum amylase levels of 15 patients with mumps are compared with amylase levels in children with other upper respiratory infections and with levels in two mumps complications.

* * *

Thanks are due to the chemical laboratory of the Johns Hopkins Hospital, without whose cooperation this study could not have been done.

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TABLE 2

Age in Years	Temperature	Involvement	Serum Amylase Levels
6.8	37.4°	Contact. Submaxillary swelling	296
5.0	39.4°	Contact. Nasopharyngitis	92
8.8	37.0°	Day before mumps occurred	220
4 mos.	39.4°	Meningitis	7
12	39.0°	Typhoid	280
8 mos.	38.7°	Nasopharyngitis, right submaxillary swelling	46
3.6	36.8°	Palpable parotid	256
7.8	37.4°	Post mumps 1 week	274
2.0	39.4°	Cervical adenitis	225
1.11	39.8°	Cervical adenitis	136
3.8	37.8°	Cervical adenitis	49
4.1	37.8°	Cervical adenitis	90

TABLE 3

Age in Years	Temperature	Clinical Findings	Serum Amylase Level
6.11	38.8°	Meningo-encephalitis. Bilateral parotid swelling for 2 days. No known mumps exposure	2098
5.7	38.7°	Abdominal pain, vomiting, mumps exposure. 1 day later developed bilateral parotid swelling. Pancreatitis?	1020

The JOURNAL LANCET

Official Journal of the American College Health Association, Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology

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Editorial

THE ROLE OF THE PEDIATRICIAN AND GENERAL PRACTITIONER IN MENTAL HYGIENE

The importance of mental hygiene is being increasingly recognized by the medical profession, by educators and the public at large. It is more apparent every day that if the goal of widespread mental and emotional health is to be attained it will have to come through preventive mental hygiene rather than through the treatment of those who are seriously emotionally disturbed. It is also increasingly obvious that perhaps the only, and certainly the most effective, way of preventing serious and lasting emotional and mental illness must come through constructive work with children. The pediatrician and the general practitioner have for many years been doing valuable work in mental hygiene. As their interest, knowledge, and realization of its importance increases, more of their time will be spent in this phase of their practice. Some do not realize how much they are already doing, or how much can be done in helping the child to have healthy emotional growth and development. The objection often raised by physicians regarding the inclusion of mental hygiene in their function and duty is that it takes so much time that it is impossible to effectively carry on this type of work. This objection may be valid if one is considering the treatment of those children who have serious emotional and behavior problems, but it is not valid if considering the work that can be done in the prevention of such difficulties. The physician in his contacts with the parents of children under his care can do far more than he realizes in a comparatively short time if he will give them help and guidance along some of the following lines.

1. Give them reassurance and confidence in their ability to properly direct and guide their children. Many parents are frightened and feel insecure and inadequate, and reassurance will make it possible often for them to have a happier, more normal relationship with their children.

2. Help them to know what to expect of a child at various stages in his physical and emotional growth so that they will not impose standards impossible for the child to meet.

3. Help them to see that their role as parents is not that of trying to mold and force their children into a pattern which they have set up, but rather it is their function to guide, lead and help the child to develop as an individual.

4. Help them to recognize and understand the importance of allowing a child to have all possible freedom and responsibility, with, at the same time, as little correction, nagging, forcing and punishment as possible. Point out the importance of avoiding non-essential issues, tensions and frictions.

5. Help them also to see that for the child's healthy emotional growth and development it is equally important that parents meet essential issues surely, fairly, wisely, and understandingly. Although the child must be given as much freedom as possible it is equally important that he not be given license.

6. Finally, help parents to see that if their children are to grow up emotionally happy, mature and well-adjusted adults, they must have the assurance of being tremendously loved, liked and accepted by their parents. This fundamental need of children must be met from earliest infancy, and must continue to maturity. In fact, this need for love and liking and acceptance must be met during one's whole lifetime if one is to be emotionally happy and well-adjusted. However, it is particularly important during infancy, childhood, and adolescence.

The physician dealing with children can and must continue to play a leading role in preventive mental hygiene.

EDWARD DYER ANDERSON, M.D.,
Minneapolis, Minnesota

News Items

North Dakota

When the North Dakota State Medical Association meets in Minot May 15-17, members will hear a report of a study on mental hygiene in the state as compiled by the mental hygiene committee of the association. Members of that committee met Tuesday at the state hospital at Jamestown. Dr. R. H. Breslin, Mandan, chairman, presided, and other committee members are Dr. G. S. Carpenter and Dr. A. M. Fisher of Jamestown; Dr. J. R. Ostfield, Fargo, and Dr. J. G. Lamont, Grafton.

Dr. Teodor Koivastik, a DP bacteriologist from Estonia, has been attached to the staff of the Fargo Clinic. Before the war, Dr. Koivastik worked with the bacteriological institute of the University of Tartu and served as department director of the state serum institute. He was exacuated to Germany in 1944 and later was deputy director of the DP hospital laboratory at Augsburg. He left Germany last February 1.

At the regular March meeting of the Northwest District Medical Society at St. Joseph's Hospital, guest speaker was Dr. L. B. Woolner, of Rochester, Minn., pathologist of the Mayo Clinic.

Dr. Woolner is a specialist in tumors of the lung, said Dr. Henry Kermott, secretary of the association.

The district medical group is making plans for the entertainment of the North Dakota State Medical Association at its convention here May 15-16-17, and Minot medics report that an outstanding program is being arranged.

Dr. M. W. Garrison of Minot is president of the Northwest society.

New pathologist at St. John's Hospital is Dr. Jack Spier. He succeeds Dr. T. L. Donat, former acting pathologist, who now heads the department of Roentgenology.

Trained in pathology in New York City hospitals following his completion of university work, Dr. Spier later was instructor in pathology at the school of medicine of George Washington University, Washington, D. C. Afterwards, he served as assistant professor of pathology of University of Arkansas at Little Rock, until 1948, when he became acting head of the department of pathology, also teaching in hospitals in the city.

Deciding to leave the academic field, Dr. Spier accepted an appointment here, effective April 1. He is the author of several papers on tumors and general pathology.

The Grand Forks Clinic announces the addition of Dr. Frank A. Hill to the clinic staff. Dr. Hill's practice is limited to obstetrics and gynecology.

The name of the Roan and Strauss medical clinic is now changed to the Missouri Valley Clinic. Neither of the two founding doctors are associated with the clinic any longer, therefore the name was changed.

The clinic was founded by Dr. M. W. Roan and the late Dr. F. B. Strauss, who died in 1946. Dr. Roan retired from his medical practice about two years ago.

Members of the clinic today include Dr. P. L. Owens, senior member, who has been on the staff for 20 years, Dr. C. A. Arneson, Dr. J. C. Cartwright and Dr. R. B. Cochran.

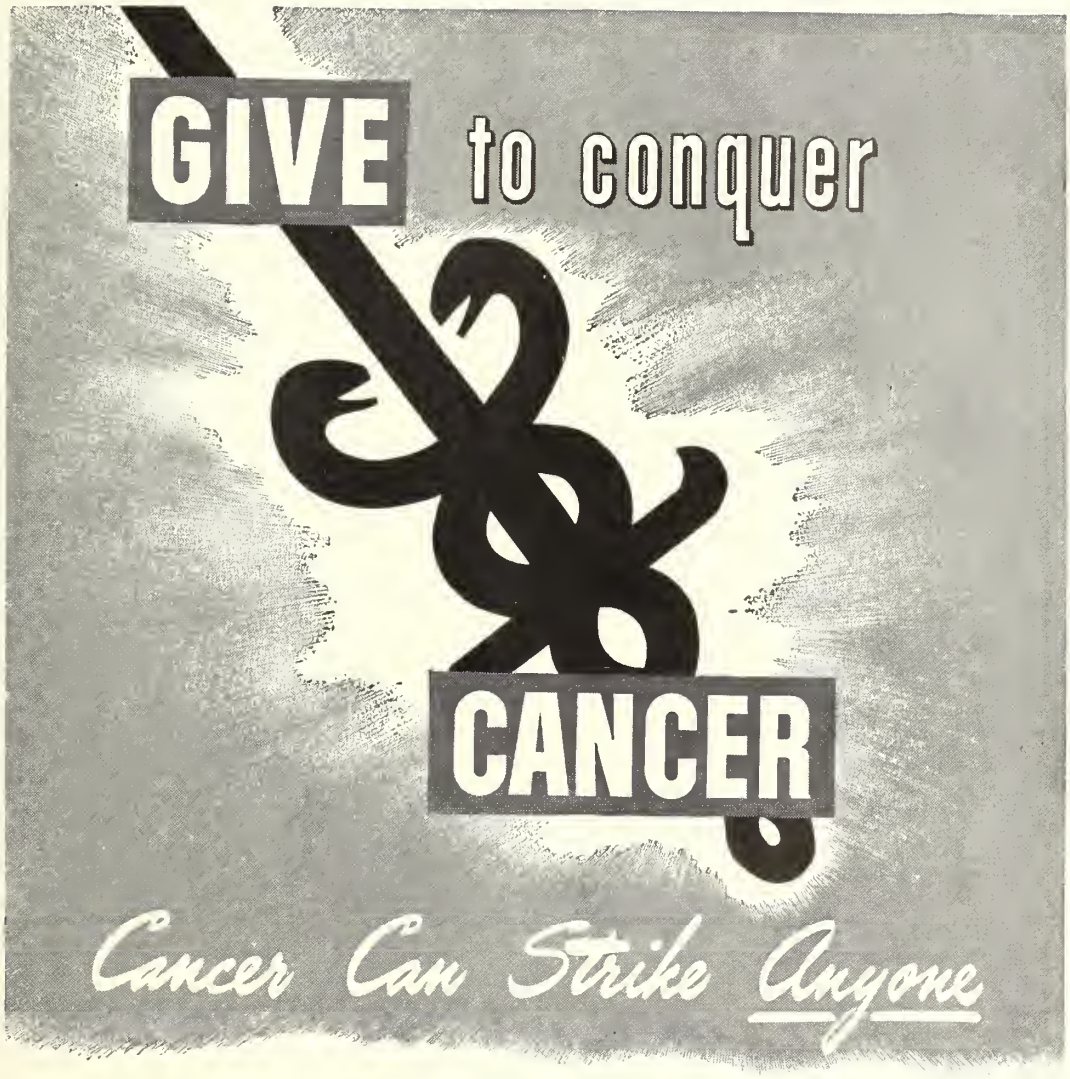
Minnesota

Dr. E. J. Huenekens, chief of staff at Sister Elizabeth Kenny Institute and clinical professor of pediatrics at University of Minnesota, has been appointed national medical director of the Kenny Foundation, it has been announced by Donald C. Dayton, Foundation president.

In his new position with the Foundation, Dr. Huenekens will be in contact with medical leaders throughout the country with the aim of creating broader understanding of the Kenny concept and treatment of polio.

Dayton also announced that Dr. Wallace H. Cole of St. Paul, director of the division of orthopedic surgery of University of Minnesota medical school, has accepted the position of consulting orthopedist on the Kenny Institute staff.

Dr. Cole was one of three medical men who originally observed the work of Sister Kenny when she first came to Minneapolis in 1940 and his announced affiliation with the Institute renews close association with the other two, who are presently members of the staff.



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They are Dr. Miland E. Knapp, chief of physical medicine in charge of training and treatment, and Dr. John F. Pohl, orthopedic consultant.

Dr. Knapp is a former president of the American Congress of Physical Medicine and former chief of staff at St. Barnabas Hospital. He is associate clinical professor of physical medicine at University of Minnesota.

Dr. Pohl is former medical supervisor at Kenny Institute.

Dr. Ralph Rossen, superintendent of Hastings state hospital, lead a discussion on personnel problems at a nation-wide mental hospital institute in Philadelphia April 11 to 15.

The institute, which attracted state hospital superintendents, state officials and outstanding psychiatrists, was sponsored by the American Psychiatric Association.

Theme of the five-day conference was "practical ways of improving treatment and care of mental hospital patients under existing circumstances." Others who attended from Minnesota include Dr. Edmund Miller, superintendent of Anoka state hospital, and Dr. Royal Gray, head of the mental hygiene unit of the state division of public institutions.

Dr. Arthur C. Skjold was elected chief of staff at Fairview Hospital, Minneapolis. Dr. Silas Anderson was elected vice chief of staff; Dr. Harry Mixer, secretary, and Dr. Stanley Stone, treasurer. Elected to the executive committee were Dr. Donald B. Frane, Dr. Harry B. Hall, Dr. Louis J. Roberts and Dr. R. W. Kouchy.

Dr. Myron M. Weaver, assistant dean of the University of Minnesota medical school, has been named dean of a new medical school at the University of British Columbia, near Vancouver, Canada.

Finishing his sixth year at Minnesota, Dr. Weaver will take over his new job July 1, and spend a year preparing to open the new medical school in the fall of 1950.

Dr. Reuben A. Johnson has been elected first president of the newly-organized Minneapolis Society of Internal Medicine.

It includes nearly 70 physicians practicing the specialty in Minneapolis and Hennepin county, a number of full-time specialists in chest diseases at Glen Lake Sanatorium and several full-time members of the staff at University and Veterans hospitals.

Other officers include Drs. Reuben Berman, vice president; George N. Aagaard, secretary; Russell M. Wilder, recorder, and Harold E. Miller, treasurer. The executive committee includes the officers and Drs. Moses Barron, Henry Ulrich, George Fahr, Douglas P. Head, and Richard V. Ebert.

Dr. Owen H. Wangensteen, head of University of Minnesota, left the States for Puerto Rico, where he took part in a conference of the Puerto Rico Medical Association.

South Dakota

Most of Yankton's medical men were in Vermillion to attend the annual spring meeting of the Yankton District Medical Society. The group discussed plans and arrangements for the State Medical Association meeting to be held in Yankton three days, May 21-23. State Secretary John Foster of Sioux Falls was present to discuss the convention with the doctors.

Presiding over the meeting of the Society was Dr. C. B. McVay, Yankton, president, and an attendance of about 50 doctors was noted. The scientific program was presented by members of the faculty of the University School of Medicine, Dr. Donald Slaughter, dean, and Dr. R. L. Ferguson, professor of pathology. They discussed newer treatments of cancer and illustrated the subject with a sound-color film.

Four Huron doctors were welcomed into the South Dakota Medical Association's "50-year-club" and presented gold lapel pins, boosting the state club membership to six.

Doctors honored were O. R. Wright, who has practiced medicine 56 years; H. L. Saylor, 55 years; F. L. Class, 51 years and T. J. Wood, 52 years.

John T. Foster, executive-secretary of the state medical association, made the pin awards at a meeting of about 40 doctors at the Huron Country Club.

Another public servant who has reached his fifty years of continuous activity in the medical service is Dr. Fred A. Richards of Sturgis.

Dr. Richards came to Whitewood in 1889. He took his medical education at the College of Physicians and Surgeons, the medical department of the University of Illinois at Chicago.

He graduated from the University of Illinois medical school in 1899. After his graduation he took special training at the Chicago Lying-In hospital under Dr. De Lee, and later a special course at the Chicago Poly Clinic.

More than 400 persons from Tabor and community, other South Dakota cities and several other states paid tribute to Dr. and Mrs. Frank M. Blezek for their 45 years of "unselfish service to this community."

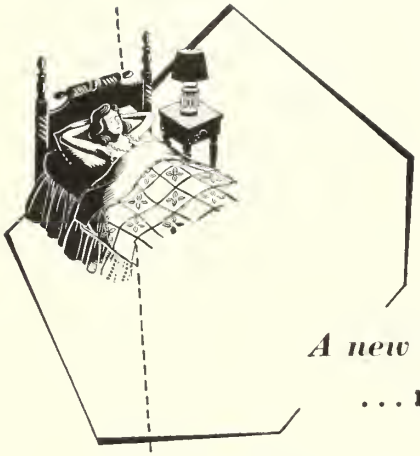
Obituaries

Dr. H. P. Sawyer, 78 years old, a resident of Goodhue for 44 years, died March 10 at a Red Wing hospital. He had been ill for the past several years.

Born in Steele county November 25, 1870, he attended county schools and was graduated from the Owatonna high school in 1899. He taught school for two years and then entered the medical department of the University of Minnesota. Following graduation, he began practicing in Goodhue in 1905 and continued work until 1931, when he retired.

Otto Friederich Schusler, 75, retired orthopedic surgeon, died April 19.

Dr. J. Leland Van Gorden, 74, a Minneapolis physician for 33 years, died April 19 in Eitel hospital. Dr.



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Van Gorden was a graduate of the University of Iowa and practiced at Emmetsburg and Des Moines before coming to Minneapolis.

Dr. William A. Plummer, 65, a member of the staff of the Mayo Clinic for almost 40 years, died of a heart attack at his home March 22.

Dr. Plummer, the youngest brother of the late Dr. Henry Plummer, came to the Mayo Clinic in June, 1910, after his graduation from the Northwestern University Medical School.

Dr. Plummer was born at Racine June 30, 1883. Both his father and grandfather were doctors. His father, Dr. Albert Plummer, was well known in southeastern Minnesota.

Dr. Harold E. Foster, 54, superintendent of the Fort Meade veterans hospital, died April 19 of a heart attack.

Dr. Foster, a veteran of both world wars, assumed administration of the hospital last July. He had been connected with the Veterans Administration since 1927.

Dr. Henry Lester Baker, Chicago, formerly of Dresbach, Minn., died at his home in Chicago March 5.

Dr. E. H. Maercklein of Ashley, who has been in the medical practice at Ashley since 1903, passed away at the Veterans Hospital at Fort Snelling, Minn., Sunday evening, March 6th.

Dr. Maercklein began the practice of medicine in Ashley in partnership with his brother Fred in 1903 and has been in Ashley since that time, with the exception of about two years.

Word was received in Gretna and Neche of the death of Dr. J. A. McKenzie at his home in Milwaukee, Wis. Dr. McKenzie was a former Gretna doctor and was well known in this community.

Advertisers' Announcements

PRISCOL BECOMES PRISCOLINE

A change in name from Priscol to Priscoline has been announced by Ciba Pharmaceutical Products, Inc., for its new vasodilator which has gained wide medical acceptance since its introduction last September. The change in name has been made to avoid conflict with Drisdol, manufactured by Winthrop Stearns. Priscoline is the first effective vasodilator that has been available in prescription form. It can be taken in the form of tablets or administered by injection both intravenously and intramuscularly. It has proved highly effective as a sympatholytic and adrenolytic agent in peripheral vascular diseases and a recent report in the New York State Journal of Medicine from a group of doctors at the Kingston Avenue Hospital in Brooklyn told of the dramatic relief from pain that administration of this new drug gave to polio victims suffering from spastic conditions.

HIGH-POTENCY HEPARIN PREPARATION

Organon Inc., of Orange, N. J., (formerly known as Roche-Organon Inc.) has announced to the medical profession a new, high-potency heparin preparation—Liquaemin (High Potency) 'Organon'—containing 50 mg. of heparin sodium per cc. of solution. This preparation is especially well suited for administration by intermittent injections—the method which is currently being recommended in many cases requiring anticoagulant therapy because of the noteworthy advantages over continuous intravenous drip.

Recent studies have indicated that adequate therapy with heparin materially reduces the dangers of certain thromboembolic complications, in particular those which occur during coronary thrombosis, acute myocardial infarction, phlebothrombosis, and thrombophlebitis. Liquaemin (High Potency) finds its chief usefulness in the treatment of these conditions, although it may be used as well in frostbite, vascular surgery, blood transfusions, and all other disturbances in which anticoagulant therapy has been shown to be of value. By the intermittent injection method—intravenous, subcutaneous, or intramuscular injections—the dosage of Liquaemin ranges from 25 to 100 mg. given at intervals of 3 to 12 hours, depending upon the patient's response as determined by the clotting time. The coagulation time should be maintained at 20 to 30 minutes by the Lee-White method or about 15 minutes by the capillary tube method.

Liquaemin (High Potency) is available in 10-cc. vials containing a total of 500 mg. of heparin sodium per vial. Liquaemin 'Organon' is still available in its original strength of 10 mg. of heparin sodium per cc. in 10-cc. vials.

BECOMVITE TABLETS

Sharp & Dohme, Inc., Philadelphia, announces the national release of 'Becomvite' Tablets, a B-complex and ascorbic acid preparation highly successful in the treatment of vitamin B and C deficiency states.

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'Becomvite' Tablets are indicated in the treatment of beriberi, pellagra, riboflavin deficiency, scurvy and selected submarginal B-complex avitaminoses. This new product is also useful as a supplement in the therapy of typhoid fever and other infections in which there is a markedly elevated metabolic rate during the period of high fever. It is also used to replace vitamin losses following surgery.

Each 'Becomvite' Tablet contains thiamine hydrochloride (vitamin B_1), 10 mg.; riboflavin (vitamin B_2), 10 mg.; pyridoxine hydrochloride (vitamin B_6), 1 mg.; niacinamide, 100 mg.; calcium pantothenate, 5 mg.; ascorbic acid (vitamin C), 100 mg.

The suggested adult dose of 'Becomvite' Tablets is one tablet daily. If the symptoms are severe this dosage may be increased at the discretion of the physician in accord with the patient's requirements.

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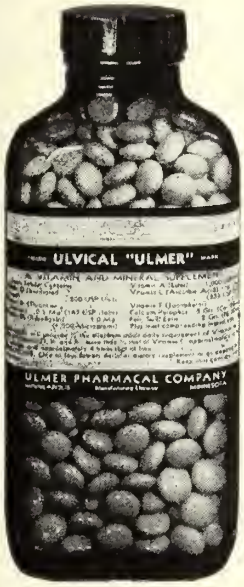
Official recognition that there is a place in the diet of the elderly for a special dietary supplement was the recent acceptance of Gerilac by the Council on Foods and Nutrition of the American Medical Association.

Extremely gratifying results from using Gerilac as a diet supplement in 38 surgical and non-surgical cases, ranging in age from 50 to 86, were reported by Joseph L. DeCourcy, M.D., of Cincinnati, in the November-December, 1948, issue of *Geriatrics*.

This official recognition of the special food coincides with a marked increase in popular interest in geriatrics which results from health education activity, articles in the lay press, and the publishing of an official journal by the American Geriatrics Society. The Borden Company, makers of Gerilac, reports increasing inquiries about Gerilac which indicate public awareness of the importance of special diet in advanced years.

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The JOURNAL LANCET

Minneapolis, Minnesota
June, 1949

Vol. LXIX, No. 6
New Series

Foreword

The physician of today is confronted by a body of information of ever increasing scope and depth. Medical societies, medical publishers, schools of medicine, and all those organizations which hope to assist in keeping the physician informed must decide which of two approaches they will utilize. Shall they adopt the first method of presenting a number of unrelated pertinent subjects or shall they use the second approach, that of concentrating attention upon a group of diseases or a system of the body. The University of Minnesota Medical School through the Center for Continuation Study is more and more following the second policy, that of covering more thoroughly a limited area of medical science.

The Journal-Lancet has frequently devoted its pages to a similar purpose and has presented symposia of interest to the practicing physician. In the pages that follow, the editors present a series of articles on the allergic states. Some of the material has been presented by the authors in continuation courses offered recently at the Center for Continuation Study.

It is particularly fitting that allergy should be presented at this time. In recent years, many new drugs have been released for use in the treatment of allergic disorders. In addition allergic mechanisms or immune mechanisms have been shown to play an important part in the etiology and pathogenesis of such diseases as rheumatic fever and lupus erythematosis. It is important, therefore, that practicing physicians have an understanding of the fundamentals of the allergic response.

This symposium is presented with the hope that it will not only be of practical value in the diagnosis and management of the allergic disorders, but that it will also contribute to a greater understanding of the mechanisms through which such disorders arise.

George N. Aagaard, M.D.

Allergic Rhinitis in Pediatrics

Albert V. Stoesser, M.D., Ph.D.*
Minneapolis, Minnesota

This discussion is limited to allergic rhinitis in infants and children. The condition has been referred to as vasomotor rhinitis, perennial hayfever, or atopic coryza. For many years this allergic manifestation was considered to be most common in the older child but more accurate observations have revealed that it may be found in the young child. There are cases in which the infant has had a chronic nasal discharge. At first this was thought to be due to an irritation of the nasal mucosa by the vomitus of babies who regurgitate frequently. Then the lint from blankets and fuzzy garments was named as the cause. Occasionally infections in other members of the family were blamed. In the latter instance, however, the nasal symptoms are usually present for the average duration of any inflammation of the nose. The infants with a clear nasal discharge with or without obstruction for a relatively long period of time offer a difficult problem for the physician.

From early life the symptoms move on into childhood. Periodically there are flareups with fever and the discharge becomes mucopurulent. These episodes may occur quite frequently and there was a time in the past when removal of the adenoids was recommended as the best form of treatment, regardless of the age of the child. Some of the patients responded well, but many did not and with the introduction of sulfonamides, the latter group received these drugs frequently. Later penicillin was employed, and now aureomycin has been tried with doubtful results.

The question is whether the children are suffering with a chronic infection or repeated infections, or an allergic manifestation. Most important is the family background. Often this is forgotten. A history of allergy or allergic disease in the mother and/or the father is most significant. It must be investigated. Then, too, the infant may have a concomitant allergic condition such as eczema or urticaria. Such a situation makes the diagnosis much easier. One of the recent important developments is the close watch of the patient. Sulfonamides or penicillin are not to be administered for all flareups in nasal symptoms. Instead, make every effort to convince the parents that the child must be observed over a fairly reasonable length of time.

Examination of the patient usually will reveal nothing except some disturbance in the nasal passages. In the infant and young child the turbinates are frequently moderately swollen, the mucous membrane is pale and quite moist, and there is much thin clear discharge. Older children may have the same picture but there are instances in which the nasal mucosa is greatly swollen and deep red in color. Obstruction is the chief symptom and there is little secretion. Often these cases are hard to differentiate from those suffering from chronic infections.

A history of allergy in the family warrants an examination of the nasal secretion. A clear discharge may reveal on examination of a stained smear a predominance of eosinophiles and a cloudy almost mucopurulent one may be loaded with clumps of the same cells. In such cases the cutaneous allergy tests are indicated. This procedure has been recommended by some physicians, condemned by others. Extensive observations have shown that the tests have gained favor in the hands of the clinicians who have investigated this diagnostic tool thoroughly enough to know what constitutes a good procedure. Fresh allergens must be employed. The method of application must be uniform and in children nothing is better than the puncture technique. The interpretation of the positive reactions must be made in the light of the age of the child, the food habits, the environment and the severity of the allergic rhinitis. The greater the number of children offered the complete set of cutaneous tests, the larger the percentage of satisfactory results.

The treatment of the infant and child with a nasal allergy involves a thorough clinical study. First, the general condition of the patient should be considered. What is the nutritional status? Is the hemoglobin at the proper level? Do the urine and blood examinations reveal any evidence of infection? If so, is it located in the teeth, throat, ears, or the urinary tract? All these questions must be considered. If any trouble is found it should be corrected, but there is one exception, namely the removal of the tonsils and adenoids. If this operation is necessary, it would be best to wait until after the child is under control from the allergic standpoint.

The emotional status also is important. Many homes are in constant turmoil and the allergic child appears to be upset most of the time. Meals are irregular, hours of sleep are too few. As a result the young patient is irritable, the older one tired and disinterested. Progress can not be obtained with any form of therapy for allergic rhinitis until the home life of the child is made as cheerful and regular as possible.

The sensitivities of the patient require plenty of consideration. In the infant there are the foods, occasionally the inhalants. The preschool child has both food and inhalant sensitivities. The school years bring more emphasis on the inhalants, including the pollens and molds. A few children have a true sensitivity to bacteria.

Presented at Continuation Course in Pediatrics, University of Minnesota Center for Continuation Study, Minneapolis, Minn., April 7, 1949.

*From the Division of Pediatrics of the Minneapolis General Hospital and the Department of Pediatrics of the University of Minnesota Medical School.

What can be done about these so-called allergies? The majority of the patients have only a few, although physicians have discouraged parents by telling them that their children are sensitive to many things. After years of investigation in the allergy clinics, the handling of these cases has developed into a definite pattern. The results have been most encouraging.

It takes much time on the part of the clinician and good cooperation from the parents to fight the child's sensitivities. A good history and set of skin tests may be the basis for recommendations as to the way the child is to live. During the interviews with the parents, the following must be discussed in detail:

1. Diet eliminations
2. Household pets or animals
3. Reduction of allergens in bedroom
4. Avoidance of dust in other parts of home
5. Blooming house-plants
6. Perfumed things containing orris root
7. Insecticides
8. Odors and smoke
9. Drafts in the home
10. Bathing and swimming
11. Nasal medication (nose drops)
12. Exertion (too active play)

Never should the physician assume that the mother and father know much about the handling of their allergic child. The parents must be shown that a progressive interest in the care of the sick individual is most essential. Nothing is more encouraging than to have them return for further advice and at the same time indicate how much they have already accomplished. Intelligent questions clearly reveal that the parents are looking for more and more things to do in order to improve the child's way of living.

The elimination of the offending foods from the diet and/or the removal of the irritating inhalants from the environment is important before any drug therapy is considered. No medication is to be placed in the nasal passages, nothing is to be inhaled, no suction is to be employed. The so-called antihistaminic preparations may be prescribed with the warning that they be discontinued as soon as possible. Neo-hetramine, Neo-antergan and Pyribenzamine are recommended for the average case especially as a daytime medication. The infant and young child may be given Syrup of Neo-hetramine or Elixir of Pyribenzamine. Histadyl, Thenylene, Diatrin, Tagathen and Chlorothen offer a moderate amount of sedation. Small children tolerate Syrup of Histadyl most satisfactorily. Trimeton, Pyrrolazote, Decapryn and Benadryl must not be forgotten. The latter two have a definite sedative effect and can be employed at bedtime and during the night, as Syrup of Decapryn or Elixir Benadryl.

Some patients appear to be quite tired in connection with their nasal allergy. Many of these children are benefited by the antihistaminic called Thephorin, which may be prescribed as a syrup or tablet. Furthermore, this drug has been used in cases who have a tendency to cough. It has helped. However, the same response has been obtained from Hydryllin. Definite coughing spells have been controlled by Benylin, Pyribenzamine Expectorant or Syrup of Hydryllin Compound.

A chronic cough may develop in association with the allergic rhinitis. This can be a forerunner of bronchial asthma, especially if there is no evidence that an infection is present. These children must be watched closely for the first signs of wheezing. More emphasis than ever before should be placed on the elimination and reduction of the offending allergens in the child's environment. The antihistaminic drugs must not be pushed. Sometimes it is best to discontinue their use and substitute preparations containing a little ephedrine and an iodide.

Hyposensitization therapy in the infant and young child with allergic nasal symptoms exclusive of pollinosis is over-rated. After seventeen years of observation of the various methods recommended, the conclusion has been reached that there is still much room for improvement. It must be remembered that foods and inhalants are relatively poor antigens. They do not easily stimulate antibody formation of lasting significance. It makes little difference as to whether one employs the subcutaneous or the intracutaneous route of administration, and uses very low or rather high doses of allergens. Occasionally the response to this form of treatment is encouraging, but it usually is of short duration. Most often the house-dust inoculations do appear to be of some value. However, many parents soon discover that their children do just as well without the specific therapy provided they are very careful with the way each child lives.

The general welfare of the patient, mental as well as physical, must be considered in connection with repeated inoculations. Quite a number of children are upset by this procedure, especially after they are old enough to learn that there appears to be no definite time for the termination of the treatment. Happy is the youngster who knows what to leave out of his diet and avoid in his surroundings, thereby requiring no so-called "shots."

Many of the cases responding quite satisfactorily to the various allergenic preparations have been analyzed. They have revealed that there may be a release of antibodies as a result of shock from the injection of a foreign substance. Boiled milk and typhoid vaccine have given the same results. The element of specificity becomes questionable.

The frequent administration of sulfonamides and penicillin or aureomycin to children who have a definite allergic rhinitis with repeated elevations in temperature is a poor procedure. Most of the trouble is located in the posterior aspect of the nasal passages or in the nasopharynx. Better ventilation of the former through a more thorough control of the child's allergic condition including the use of antihistaminic drugs, and the removal or reduction in the lymphoid tissue on the posterior wall of the pharynx will help. Radium therapy can be considered.

SUMMARY

Allergic rhinitis may appear early in infancy and extend in increasing incidence through childhood. A history of allergy in the family is an important diagnostic factor.

Inspection of nasal passages, examination of the nasal secretions, and a good set of skin tests are of much help in establishing the proper treatment.

Therapy takes into consideration the general condition of the children, physical as well as mental. Elimination or reduction of the offending allergens as applied to the way the child lives is more satisfactory than specific treatment.

The antihistaminic drugs may be employed but discontinued as soon as possible. Coughing, leading to wheezing, is a contra-indication in the use of these preparations.

REPORT OF THE NORTH DAKOTA STATE MEDICAL MEETING

Election of officers concluded the business meeting of the 62nd annual North Dakota State Medical Association Meeting. Dr. W. A. Wright of Williston was installed as president, succeeding Dr. W. A. Liebeler of Grand Forks. Officers elected were: Drs. L. W. Larson, Bismarck, president-elect; W. E. Lancaster, Fargo, first vice president; O. W. Johnson, Rugby, second vice-president; O. A. Sedlak, Fargo, secretary; E. J. Larson, Jamestown, treasurer; A. E. Speak, Dickinson, speaker; G. A. Dodds, Fargo, vice-speaker.

Councillors elected were Dr. J. C. Fawcett, Devil's Lake; Dr. Joseph Sorkness, Jamestown; and Dr. A. R. Gilsdorff, Dickinson. Recommended to the governor for appointment to the state board of medical examiners were Drs. C. J. Glaspell, Grafton; D. J. Halliday, Kenmare, and Joseph Sorkness, Jamestown. Dr. M. S. Jacobson of Elgin was recommended for appointment to the state health council and Dr. L. W. Larson of Bismarck was appointed to the medical center advisory council.

The last two days of the convention were scheduled for the scientific program. The main speakers included: Drs. G. A. Kernwein, Minot; Jerome Hilger, University of Minnesota; G. Alfred Dodds, Fargo; N. O. Brink, Bismarck; J. R. McDonald, Mayo Clinic; Oswald Wyatt, University of Minnesota; A. L. Cameron, Minot; E. A. Haunz, Grand Forks; J. J. Ayash, Minot, and Colin S. MacCarty, Mayo Clinic.

Special luncheon meetings were held by the North Dakota State Pediatric Society, Society of Obstetrics and Gynecology, and the Academy of Ophthalmology and Otolaryngology.

JOURNAL-LANCET LECTURESHIP

Dr. Leslie J. Witts, Nuffield Clinical Professor of Medicine at Oxford University, England, is the speaker for the annual lectureship sponsored by the JOURNAL-LANCET for the University of Minnesota Medical School. His lecture, "Intestinal Macrocytic Anemia," will be presented Wednesday, June 8th at 3:00 p.m. in the Todd Amphitheater, University Hospital.

Dr. Witts has gained world-wide recognition for his work in blood and liver disease. In England he is particularly well known for his work during the war as the Administrator of Civilian Medical Affairs.

The JOURNAL-LANCET Lectureship was established nine years ago and has afforded many fine speakers for the advancement of medical knowledge in the upper midwest.

The Management of Status Asthmaticus

William Sawyer Eisenstadt, M.D.
Minneapolis, Minnesota

Status asthmaticus is a condition of severe, continuous asthma, unrelieved by injections of epinephrine even when frequently repeated and in increased dosage. The patient is very ill and may die unless the attack of asthma is broken. When this occurs, its treatment taxes the ingenuity of the best clinician.

When these patients are first seen, they give the classical picture [1] of severe asthma. They are usually in a sitting position with the body slightly forward from the waist, their hands grasping the edge of the bed or chair. The accessory muscles of respiration are forcibly in use, the face is drawn and ashen. The pallor may at times give way to cyanosis. Perspiration is profuse, for these patients are laboring for breath. The patient is terrified because of the repeated failure of the usual therapeutic medications. In addition, the family is anxious. There is a generalized spirit of hopelessness present and, not infrequently, the physician shares this feeling. This period of intense dyspnea may last from a few days to a week or two.

Status asthmaticus occurs chiefly in the group of intrinsic or infectious asthmatics, a group usually developing asthma for the first time in middle or later life. This condition occurs less frequently in the extrinsic asthmatic and then it is usually due to specific sensitivities. As a rule, when intractable asthma occurs in the extrinsic asthmatic, the solution of the problem may be relatively simple, representing nothing more than the removal of the offending agent or agents from the patient's environment, or the removal of the patient from them.

Most of the fatalities in bronchial asthma occur in status asthmaticus. Death may be due to asphyxia or cardiac failure, but just as often, perhaps, it is due to exhaustion and dehydration.

The most consistent pathological finding in patients who have died in status asthmaticus [2] is the presence in the small, medium or large bronchi of thick, tenacious, gelatinous secretions which the patient was unable to raise. Much of the bronchial tree may be entirely occluded. In addition to these mucous plugs, edema of the bronchial walls and bronchospasm contribute to this bronchial occlusion.

Examination of the chest elicits surprising findings to the uninitiated. Everyone is familiar with the "bandbox" heard in mild cases of asthma where there is only partial but widespread occlusion of the bronchi, as a result of which the sounds are widely distributed. In status asthmaticus, one finds areas of diminished and absent breath sounds, areas of quiet that to the experienced observer are ominous. In these patients, areas of lung have ceased to function normally because the bronchi serving those portions may be partially or totally occluded by thick, tenacious, gelatinous plugs of mucus. When one listens to such a chest, the need for prompt and vigorous therapeutic measures is immediately apparent.

The basic principles involved in a proper therapeutic approach in the treatment of status asthmaticus are (1) to increase the lumen of the respiratory passageway, and (2) to decrease the minute volume of respiration.

The following discussion sets forth a routine for the treatment of status asthmaticus which has produced the most favorable response.

Hospitalize

Hospitalization should be insisted upon immediately. This will accomplish several indispensable purposes. First, the patient is removed from intimate contact with over-anxious relatives. Further, the hospital offers trained personnel, equipment and medicinal agents not readily available in the home.

Although most of the patients fall in the intrinsic or infectious group, environmental factors should not be overlooked. Thus, the removal of the patient from the environment in which this condition developed may frequently be beneficial. If the status asthmaticus is due to pollen in the air, air conditioning with filtration is desirable if available. The ordinary precautions for the preparation of a dust-free room should be adhered to. It is wise to cover both the pillows and mattress with non-allergic encasings. Flowers should be prohibited.

Stop all epinephrine and ephedrine compounds

We believe that this is the most important procedure employed. If nothing else can be done, this is the one thing to do. These patients have already received epinephrene, epinephrine-like, ephedrine and ephedrine-like compounds, to the point of nervous irritability and toxicity. They are "epinephrine-fast." Further epinephrine will only increase the patient's irritability and nervousness, produce tachycardia, palpitation, headache, pallor and weakness, with no effect on the dyspnea itself. The continuance of status asthmaticus proves the medication to have been ineffective, and a new start should be made. All sympathomimetic medications should be removed for a period of 48 to 72 hours, preferably the latter, and only then reintroduced. During this interval there is a strong temptation to reintroduce epinephrine, especially when the patient continues in relatively severe asthma and substitute therapy is of relatively little value. However, the discontinuance of epinephrine should be adhered to strongly during this interval.

When reintroduced, small quantities should be given, 0.3 to 0.5 cc. (5 to 8 minims), and repeated as often as necessary, even within 15 or 30 minutes. The smaller

quantities will obviate the side effects of epinephrine and will produce the same therapeutic effect as larger quantities. It is preferable to use the aqueous (1–1000) epinephrine, rather than the prolonged type (1–500) in sesame oil, peanut oil, or gelatin. In a hospital there is no particular advantage in using the prolonged acting preparations for there is always the danger of overdosage from too rapid absorption, especially if the syringe is wet, with resultant side effects.

The problem in the treatment of status asthmaticus resolves itself into keeping the patient alive and as comfortable as possible for the next 48 to 72 hours following admission, for whatever the cause, when epinephrine is again introduced, invariably the patient will respond, especially if the other measures recommended in this paper are adhered to. If there is no accompanying infection in the bronchi, or the infection is minimal, the response will usually be immediate and fairly complete. If the accompanying infection is moderate, the response to epinephrine will be modified. The greater the accompanying infection, the less the response, but there will be a response. In the presence of infection, methods to combat the infection should be instituted immediately. The use of antibiotics, which are of great importance here, will be discussed subsequently.

Hydration

This extremely important phase of treatment is almost always neglected. These patients are dehydrated. They have been sick for a number of days without sleep, food or fluids. This is evidenced on admission by the very noticeable relative increase of the blood hemoglobin, red blood cell count, white blood cell count with a normal differential, along with a minimal increase of body temperature of about a degree. These soon return to normal after adequate hydration within 24 to 48 hours.

We routinely give 2 to 3 liters of 5 per cent glucose in distilled water or in isotonic sodium chloride solution alternately during the first two or three days of hospitalization. Additional fluids should be given orally as tolerated. These fluids will replace lost body water and bring about a positive water balance. They tend to thin out the bronchial secretions and thus promote expectoration of the thick, gelatinous, inspissated mucous plugs in the bronchi. The dextrose used in hydration therapy will supply needed calories and replace liver glycogen, badly depleted because of the previous repeated injections of epinephrine and the failure of the patient to take adequate nourishment. Glaser [4] suggests that this depletion of glycogen may be a factor in the development of epinephrine fastness.

In the past, hypertonic dextrose [5,6] solutions up to 50 per cent, given in quantities from 50 to 100 cc., at intervals of six to eight hours, have been recommended. The idea was to produce dehydration of the lungs and thus lessen the edema of the bronchi. However, its accompanying effect of dehydrating the patient generally and thickening the bronchial secretions defeated one of the major objectives of treatment — the evacuation of the thick, inspissated mucous plugs. Because of this effect, the use of hypertonic dextrose solutions should be discarded.

Aminophyllin (Theophylline with Ethylenediamine)

The bronchodilating effect of aminophyllin intravenously at times is lifesaving. Initially, the patient should receive 0.25 grams (3¾ grains) in 10 cc. of diluent given slowly, preferably through a fine needle. If this dose is sufficient for symptomatic relief, it can be repeated every four to six hours. If relief is only partial, the dosage may be increased to 0.5 grams (7½ grains) in 20 cc. of diluent. When given slowly and regulated to the patient's tolerance, the toxic effects of aminophyllin, such as vertigo, faintness, headache, tachycardia, palpitation, extreme flushing and sense of heat, substernal distress, and nausea and vomiting may be obviated. If they do occur, they may be minimal. In uncomplicated asthma, aminophyllin is not a dangerous drug. However, in the presence of cardiac complications caution must be used. The need for repeated intravenous injections of aminophyllin may be lessened by inserting 0.5 gram of aminophyllin per liter of fluid during the period of venoclysis.

The drug is also moderately effective when given rectally, either in suppository form or as a retention enema. The suppository contains 0.5 gram of aminophyllin. One-half gram of aminophyllin powder dissolved in 30 to 60 cc. of tap water may be used as a retention enema.

Continuous intravenous aminophyllin in status asthmaticus has recently been introduced by Goodall and Unger.[7] Dosage consisted of up to 2 or 3 grams of aminophyllin dissolved in 2,000 cc. of 5 per cent glucose in physiological salt solution or distilled water alternately, given at the rate of 28 drops per minute. The solution is given continuously over a 24 hour period for several days until relief is afforded.

We see no particular advantage to this method, because the same coverage can be achieved by employing repeated intravenous injections of aminophyllin together with rectal suppositories or retention enemas, without the extreme inconvenience to the patient of having a needle in his vein continuously for three or four days. This is extremely important when considering that the patient in status asthmaticus is already in extreme discomfort because of his marked dyspnea.

Occasionally patients may become refractory to the intravenous administration of aminophyllin. Recently, Prigal [8] has recommended the aerosolization of aminophyllin when this occurs. The contents of a 10 cc. (0.25 gram) or 20 cc. (0.5 gram) ampule are nebulized at six to eight hour intervals. We have employed this procedure in a limited number of patients. Definitive judgment as to its relative value remains to be determined.

As in the case of "epinephrine fastness," when patients become refractory to aminophyllin by intravenous injection or aerosolization, its use should be discontinued, as further dosage will serve only to increase its toxic effects.

The use of intravenous aminophyllin in the treatment of children may be employed in the same manner, the dosage being .006 grams per kgm. (1/20 grain per pound).

Inhalation Therapy

Inhalation therapy is directed toward decreasing the minute volume of respiration. It rarely of itself will interrupt status asthmaticus. Its use is therefore employed to make the patient more comfortable by diminishing the extreme respiratory effort caused by the anoxia, by enriching the surrounding air with oxygen.

Oxygen may be employed with a tent, nasal catheter, or B.L.B. mask. At times, patients will rebel against the use of a tent because of a feeling of claustrophobia. This may increase their anxiety and nervousness, with resultant increase of their exertional dyspnea.

Barach [9] introduced a mixture of 80 per cent helium and 20 per cent oxygen, a mixture which has one-third the density of air. It therefore should diffuse more readily through the partially obstructed bronchioles. Its cost, however, is a limiting factor and, in our personal experience, oxygen has been equally as good.

Sedation

In employing sedation, one must guard against oversedation. However, measures to insure sleep and to overcome nervous tension are very necessary. We have used Demerol repeatedly, but with considerable caution. Used judiciously, it has proven to be a most effective drug. Its action [10] has apparently been twofold, sedation and a direct bronchodilating effect. In status asthmaticus, one must be extremely careful about respiratory depression and depression of the cough reflex, effects which are relatively minimal with Demerol as compared to the opiates.

In this connection, mention should be made concerning the use of morphine. In the past it has been used extensively, occasionally beneficially. However, one can say it should never be used in asthma, and especially so in status asthmaticus, where the patient is anoxic, exhausted and battling for life. Morphine depresses the respiratory center, diminishes the cough reflex and dries the bronchial secretions (especially if given with atropine). Thus, morphine actually promotes further anoxia—to the point of asphyxia—which is the very thing we are trying to combat. Because of the stagnation of the bronchial mucous plugs, the patient literally drowns in his own bronchial secretions. Vaughan [11] and Lamson [12] have shown that in many deaths due to asthma during status asthmaticus, morphine was given prior to death. The use of all other opiate derivatives should also be avoided.

The dosage of Demerol should be regulated with extreme care. Adults should never be given an initial dose exceeding 50 mgm. intramuscularly. It may later be necessary to increase to 75 mgm., and only rarely to 100 mgm. This can be repeated at 6 to 8 hour intervals. It should be used for relatively short periods, three, four or five days, because of the possibility of addiction.[13] The routine use of Demerol for the relief of the usual acute attacks of bronchial asthma, as has been advocated, is to be condemned because of its properties of addiction. When using Demerol we have avoided using other sedatives, because of the possibility of over-sedation and the depression of all body functions.

Demerol may be used in a similar manner in children, the dosage being 1½ mgm. per kgm. (1/5 minim per pound).

Other sedative measures have been advocated by others.[2] Our experience with them is limited, but we will mention them briefly. (1) Paraldehyde may be given rectally, 15 cc. in 100 cc. of olive oil at twelve hour intervals. (2) Barbiturates may be given at four to eight hour intervals. (3) Chloral hydrate, 1 gram, and sodium bromide, 4 grams, may be given at four hour intervals until the patient becomes drowsy; then stop. (4) A mixture of ether, 2 oz., and olive oil, 4 oz., mixed thoroughly, may be administered as a retention enema.

If any of the above are employed, only one should be used and not a combination. If used properly and carefully, sedation is extremely beneficial and life-saving. Its drastic use in an already exhausted and anoxic individual may be dangerous and disastrous.

Expectorants

Methods which will thin out bronchial secretions and thus will help clear the bronchi of their mucous plugs are highly desirable. The best medication to achieve this is potassium iodide. It has been shown by Tuft [14] that the iodides are excreted in the bronchi in high concentration. Ten to fifteen drops of a saturated solution of potassium iodide are recommended four times daily until the patient is free of expectoration. If there is an intolerance to potassium iodide, enteric coated ammonium chloride tablets in 0.5 gram doses may be given four times daily.

Manual Elevation of the Diaphragm

In the presence of status asthmaticus physiological pulmonary emphysema is present. There is trapped air because of the partially and completely occluded bronchioles. Manual elevation of the diaphragm, as suggested by Gay,[10] is often followed by subjective relief as well as an increase in the vital capacity from 200 to 1000 cc. The procedure is carried out as follows: the palm of either hand is placed underneath the ribs on one side and pushed upward and inward during the latter half of expiration. Then this is repeated on the other side. The escape of trapped air may frequently be heard as a wheeze. This procedure should be repeated three to four times daily.

Bronchoscopy

Although we have not had occasion to use bronchoscopy, its use should not be overlooked. The mechanical removal of thick, tenacious mucus from the bronchi would appear to be a most reasonable treatment. Bronchoscopy has undoubtedly been restricted in its use because patients seem so gravely ill that any procedure which places a greater strain upon them would almost appear to be inadvisable. In skilled hands it is a rela-

tively safe procedure and the risk is much less than that of possible asphyxia from the disease. However, preoperative medication should be kept at a minimum. Morphine and opiate derivatives are definitely to be avoided.

Antibiotic Therapy

With the advent of antibiotic therapy, another powerful weapon has been added. As stated earlier, most patients in status asthmaticus belong in the intrinsic or infectious group. Frequently an accompanying infection of the bronchi has been the cause of the intractable asthma. The presence of infection is noted clinically by an increase in body temperature, elevated sedimentation rate, the presence of mucopurulent or purulent sputum, and leucocytosis with an increase in the polymorphonuclears.

Our routine is to use combined parenteral and aerosol penicillin therapy, so that the penicillin may reach the more superficial and deeper lying tissues of the bronchi in high concentration. Fifty thousand units of penicillin in 1 cc. of distilled water, to which 3 or 4 drops of glycerin are added to stabilize the aerosol, are nebulized every three hours, with a six hour interval during the sleeping hours. If the penicillin aerosol is to be continued after the adrenalin-fastness has been broken, it is advisable to precede the inhalation of penicillin by the inhalation of a few breaths of 1:100 epinephrine, or 1:200 isuprel, so as to widen the lumen of the lung. Very often, this therapy will have to be prolonged for five to ten days following responsiveness to adrenalin, until the patient's bronchial secretions are free of discoloration and are at a minimum. At the same time, penicillin is administered parenterally with daily injections of 300,000 units of prolonged acting penicillin.

Because of the possible toxic effects of streptomycin and dihydrostreptomycin, its routine or combined use with penicillin is initially avoided. It is added only when the sputum remains purulent or in the presence of penicillin-resistant organisms in the sputum. Dihydrostreptomycin, because of its lower incidence of toxic effects, is then given by aerosolization in seven divided doses of 1 cc. each per 24-hour period in a similar manner as penicillin. The total dose per day ranges from 0.5 gm. to 1.5 gm. Its parenteral use is withheld. In our experience it has rarely been necessary to use streptomycin or dihydrostreptomycin.

Antihistaminics

The recently introduced antihistaminic drugs are of little or no value in this condition. In fact, they are contra-indicated, as they possess an atropine-like effect in drying up bronchial secretions, and thus aid in producing mucous plugs. Before substituting these medications, the action of which is neither so certain nor so prolonged, it is well to remember that epinephrine and epinephrine-like compounds are the most powerful antihistaminic agents now in use.

In summary, when one is confronted with a patient in status asthmaticus, the danger of death is ever present. The judicious use of the above procedures may be lifesaving.

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MINNESOTA STATE MEDICAL ASSOCIATION OFFICERS

Dr. Frank J. Elias, Duluth, is president-elect of the Minnesota State Medical Association. Other new officers, named at the group's convention, are Dr. William F. Hartfiel, St. Paul, first vice president, and Dr. Clarence W. Moberg, Detroit Lakes, second vice president.

Dr. Benjamin B. Souster, St. Paul, and Dr. William H. Condit, Minneapolis, were renamed secretary and treasurer, respectively. Dr. A. E. Cardle, Minneapolis, and Dr. George Earl, St. Paul, were elected delegates to the American Medical Association convention.

The Diagnosis and Treatment of Mold Allergy

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Extensive investigations during the past two decades have demonstrated conclusively that the air-borne spores of common fungi are the frequent causes of allergic manifestations. Although molds long had been suspected as a cause of allergy, the consensus for a number of years was that they represented the isolated case and were something of a medical curiosity, occurring in rare instances where there was exposure to damp, moldy basements.

Indeed, from an historical viewpoint, the significance of molds as a cause of allergy was suspected more than 200 years ago. Sir John Floyer,[1] an English physician, reported the case of an asthmatic who suffered a severe attack, which appeared to be precipitated by going into a wine cellar. It is not surprising that the first of a great host of modern reports on the molds should have come from Holland, where climatic factors predispose to a rather marked fungus growth. Van Leeuwen wrote extensively as early as 1924 about "miasms" which contaminated the air. Cadman [2] in Canada did much more to focus attention upon the fungi by his work with grain rust. Others quickly followed his leadership, and the past ten years have witnessed truly noteworthy progress in the understanding of the role of molds in allergic disease.

There no longer can be any doubt of the clinical reality of mold allergy. Numerous investigators have shown by surveys the high atmospheric concentration of molds, especially during the summer months. That this concentration is especially heavy in the grain-producing states of the Midwest has been well-established. Clinical experimentations have demonstrated that these molds are causal in the production of allergic disease. Increasing evidence has been accumulated to demonstrate that a large number of pollen-sensitive individuals are aggravated by concomitant sensitivity to seasonal molds.[3,4]

Major and Minor Molds

The major molds from a viewpoint of widespread occurrence, high atmospheric concentration and antigenicity are *Alternaria, Hormodendrum, Aspergillus* and *Penicillium*. Of these, *Alternaria* and *Hormodendrum* are seasonal molds occurring during the warm summer months. On the contrary, *Aspergillus* and *Penicillium* are nonseasonal molds of widespread occurrence and may be found at any season of the year, but reach highest atmospheric concentration when the air is warm and humid. These four varieties of fungi are especially significant in the production of respiratory allergic disease.

Sensitivity has been shown to exist to a large number of other molds which are of less significance due to numerous factors. From a clinical viewpoint they may be regarded as the minor molds: *Helminthosporium, Mucor, Chaetomium, ergot, Phoma, yeasts, Monilia, Fusarium, Trichophyton*, etc. Smuts and rusts, as causative allergens in the production of allergic manifestations, are now known to be of especial significance in grain-producing areas due to the noteworthy observations by Wittich.[3,5]

Clinical Types of Manifestations

Mold allergy may manifest itself in various forms. For convenience, the following classification may be adopted:

1. Respiratory
2. Cutaneous
3. Miscellaneous

The Respiratory Group

Individuals who are sensitive to the molds may suffer from respiratory symptoms of varying degrees depending largely upon the molds to which they may be sensitive, as well as concomitant sensitivities to pollen, house dust, miscellaneous inhalants and food. The patient sensitive to a seasonal mold such as *Alternaria* or *Hormodendrum* without complicating sensitivities usually has symptoms only during the mold season from the onset of warm spring days until snow covers the ground in the fall.

This purely seasonal mold type may show, in certain individuals, very interesting variations. If he is sensitive to pollens, he may have marked exacerbation of his symptoms during that particular pollinating season. On the other hand, sensitivity to house dust, common inhalant allergens and foods, in addition to the seasonal molds, frequently presents a picture of symptoms of equal severity the year around.

Sensitivity to some of the common nonseasonal fungi (in particular *Aspergillus*), usually results in a continuation of symptoms beyond the usual mold season, but of a somewhat milder nature. Often these patients are definitely made worse by going into damp basements, storerooms or attics.

The Cutaneous Group

Numerous reports occur in the literature of atopic dermatitis [6] due to ingestion or inhalation of molds, and contact dermatitis as a result of contact with the oil fraction of fungus spores. Conjunctivitis has been shown to occur, and Simon [7] reported an individual who had a specific conjunctivitis from molds without any other sensitivity.

The Miscellaneous Group

Ample evidence has been accumulated to show that the ingestion of certain fungi, in particular, yeast, causes a

* From the Grand Forks Clinic.

variety of allergic manifestations, from simple hives and atopic dermatitis to asthma and migraine.

Diagnosis

The diagnosis of mold allergy is facilitated by a good history. It is quite possible to tentatively diagnose, or at least to strongly suspect, mold allergy in many cases on the basis of the history alone. Careful attention to details gleaned from the patient's story reveals a number of highly significant facts: The majority of fungus-sensitive patients are usually aware of definite aggravations of symptoms during the warm months with relative freedom after snow covers the ground. Occasionally, symptoms of a considerably milder nature persist through the winter. Mold allergy is not apt to be confused with sensitivity to the pollens if close attention is paid to the history. Almost invariably, mold cases will not demonstrate the sharp seasonal delineation of pollen patients who can usually specify almost exact dates of onset or alleviation of symptoms, such as Memorial Day, Labor Day, etc.; or they may be equally positive in stating that such symptoms begin about June 1 and continue for four weeks. On the contrary, mold sensitive individuals indicate a far wider spread of season, depending largely, of course, on the degree of sensitivity. Suspicion should be directed toward the molds when there is an onset before the usual pollinating season for any of the common pollens or a continuation beyond the usual season. It must be remembered that multiple sensitivity, i. e., sensitivity of a high degree to seasonal, as well as non-seasonal mold, such as the *Aspergilli,* results in symptoms of almost equal intensity the year around. The important thing to consider is the possibility of mold sensitivity in any allergic individual and to suspect them as possible concomitant allergens even when the history indicates a pollinosis. Even more essential, of course, is to investigate them when there is evidence of slight deviation from the usual regular pattern of pollen sensitivity. (In this Clinic, testing for the common seasonal molds is done routinely *even when there appears to be no doubt* that the case presents a pure pollinosis.)

Further details of the history frequently reveal that the patient relates that he is worse in the country. Proximity to a threshing machine, harvesting and haying operations, a barn or a haystack often precipitates an acute attack. Illustrating this point is the following case report:

Case 1. A farmer, aged 21, complained of seasonal rhinitis with occasional severe asthmatic attacks. There was a definite familial history of allergic disease. The patient had had asthmatic attacks since he was a child. Questioning elicited the information that he was worse in summer and that the season extended beyond the usual limits of pollinosis. He was sure that proximity to threshing, haying and harvesting operations aggravated the symptoms. Even the act of shoving down hay from the haymow was apt to bring on a mild attack. Cutaneous testing revealed positive reactions to *Aspergillus niger, Alternaria* and *Hormodendrum,* barn dust, grain dust, stem rust, wheat smut and oat smut. Also house dust, pyrethrum and Russian thistle gave positive reactions.

Comment: This case history clearly implicated the molds due to prolongation of the symptoms beyond the pollen season. The fact that the patient was unable to actively engage in threshing operations also directed suspicion toward the molds. Treatment with an extract of the molds and Russian thistle gave very marked relief.

The history may reveal a definite sensitivity to foods containing edible fungi. In most instances, the individual is able to anticipate an attack from eating mushrooms or ingesting foods very high in yeast content.

The following case history is interesting in that it reveals sensitivity to only one of the fungi:

Case 2. A young woman complained of attacks of rhinitis and wheezing, which came on very soon after the ingestion of beer. Skin tests revealed a strongly positive reaction to yeast, but negative to *Aspergillus, Alternaria, Hormodendrum,* etc.

If the history indicates that there has been an unsuccessful attempt at hyposensitization in what appears to be a pure pollinosis, suspicion should be aroused and especial care taken to uncover the cause. While it may be due to inadequate dosage or to a selection of the wrong pollen extracts, it may be indicative of a complicating fungus allergy.

The following case report from the files of the Clinic is an interesting illustration of this point:

Case 3. A male student, age 17, gave a history of the onset of rhinitis and mild wheezing during the preceding six weeks. There was an allergic background in the family history. Persistent questioning finally brought forth the following pertinent facts: (1) That he had complained of summer asthma for years. (2) That he was free of symptoms every winter when there was snow on the ground. (3) That his asthmatic symptoms did not come on until about one month after he moved from town to the farm for the summer. Usually this onset of symptoms occurred about the last week in June. (4) That symptoms then persisted until late in the fall, well beyond the end of the customary pollen season. (5) That he was certain to have an attack within a short time after being in a barn, around threshing or harvesting operations. (6) That when he stayed in town or inside the farmhouse, he was relatively free of symptoms. (7) That he previously had hay fever injections without relief.

Skin tests showed positive tests for *Alternaria* and *Hormodendrum.* He was also positive to house dust, giant ragweed, short ragweed, bluegrass and orris root.

Comment: An attempt at hyposensitization with pollen extract had failed in this case, and the reason is obvious. In this instance the need for correlation of the pertinent facts of the history with the results of the skin tests in deciding upon a course of therapy is well shown. Certainly extracts of house dust and orris root should not be included in the treatment set, because

(1) his symptoms were entirely seasonal, and (2) he was invariably better while indoors, rather than outside.

The diagnosis of mold sensitivity may usually be confirmed by skin tests. It is good practice to do a complete physical examination, urinalysis, and a complete blood count. After this has been accomplished, the patient is ready for skin tests.

Space and time do not permit a lengthy discussion of specific examinations to determine the patient's sensitivities. As previously indicated, too much reliance should not be placed on the results of nasal, intra-ocular or skin tests. It is the practice in this Clinic to do routine scratch (cutaneous) tests. If the results are inconclusive or confusing, intradermal tests are done. Careful evaluation with the history as given by the patient is essential when the tests are interpreted. It must be remembered that as a general rule the scratch tests are less sensitive than the intracutaneous, but at the same time there are less false positive reactions. Furthermore, there is no doubt that the scratch test offers a far wider range of safety. Taub [8] reported a patient with cottonseed sensitivity who suffered a severe asthmatic attack following intracutaneous testing with a 1 to 1,000,000 dilution of cottonseed extract.

It is a routine procedure in this Clinic to test all individuals suspected of mold allergy with endo-house dust extract.[9] Repeated investigations have demonstrated that house dust is a potent allergen, and sensitivity to it is common in respiratory allergy. It is interesting to note that usually fungus-sensitive cases react positively to house dust. Conversely, house dust-positive patients do not so often react to the molds.

There can be little doubt that the molds contribute materially to the potent allergens which form house dust. Cohen [10] in 1929 demonstrated that overstuffed furniture contained more of the active dust principle than did rugs or draperies. This is also true of pillows. Old feather pillows have been shown to contain more active dust than new ones. Subsequent investigations have shown in innumerable instances that old overstuffed furniture, pillows, mattresses, etc., are excellent places for the propagation of mold growth.

Treatment

The first principle in the treatment of mold allergy differs in no way from that of other allergies. Every effort should be made to remove the causal allergen from the patient's environment. While this is quite obviously a physical impossibility due to the atmospheric concentration of seasonal molds, the fact remains that much can be done to eliminate the nonseasonal molds and secondary irritating factors found in ordinary house dust. The physician should insist upon thoroughly cleaned and aired basements and attics. All unnecessary furniture, rugs, books, clothing and pictures should be removed from the patient's room, and dust-proof coverings provided for feather pillows. Members of the family who have occasion to visit barns, granaries and grain mills should be trained to leave outer garments in an outer room before entering the house. In this Clinic the importance of dust contact is deemed so important that the patient is given the following mimeographed sheet and requested to observe it as closely as possible:

DIRECTIONS FOR AVOIDANCE OF DUST

(A) 1. Remove everything from the patient's room.
2. Empty all closets and shelves and place contents elsewhere.

(B) 1. The room must be thoroughly washed and cleaned, and all movable furniture thoroughly dusted and scrubbed.
2. *To be washed weekly*: Bedstead and open springs, floors, baseboards, mouldings, sills; walls if painted, rag rugs, window curtains, venetian blinds, bedclothing, such as sheets, blankets, pillow cases, etc. For wallpaper use wallpaper cleaner.

(C) Room may contain the following:
Plain curtains, washable wooden furniture (steel furniture is preferable), rag rugs.

(D) Room MUST NOT CONTAIN:
Heavy rugs or floor coverings, heavy drapes, hangings.
Upholstered furniture of any type.
Knickknacks, pictures, wall hangings, books.
Clothing or furs.
Quilted bed pads.
Face powder, bath powder, perfumes, toilet water or colognes.
Toys—especially those with fuzzy hair and fur.
Fresh cut flowers and live plants.

(E) USE ONLY WASHABLE TOYS MADE OF RUBBER OR WOOD.

(F) The house should be aired frequently and dust avoided in every possible way.

(G) Pets (birds and animals) must be kept out of the house.

(H) Avoid cosmetics, perfumes, insect sprays or powders, and odoriferous substances such as camphor, tar, etc.

(I) Allow no plants in the house without specific instructions.

Special Directions: Mattresses and pillows should be covered. (Special instructions will be given in regard to this.)
Leave garments in an outer room when you have been in a barn, granary or feed mill.

Specific treatment by means of hyposensitization with an extract of the molds is indicated because of the impossibility of breaking contact with the causal allergens.

When a course of hyposensitization has been decided upon, the physician is confronted with the problem of which molds to include in his mixture. No hard and fast rules can be adopted which will cover every case. Perhaps nowhere in the entire field of allergy is the thoughtful judgment of the clinician so important as here. Each case must be carefully considered, taking into account three factors: (1) the geographical location, (2) the patient's history, (3) the results of the skin tests.

In this Clinic, due to its geographical location in the valley of the Red River of the North, *Alternaria* and *Hormodendrum* present an atmospheric concentration as high or higher than any other spot in continental United States. Since they are of well-known high antigenic potential, they must be included in the event the patient's history and skin reactions indicate sensitivity. On the other hand, since there is a certain antigenic specificity between molds, if there is a reaction to *Helminthosporium* usually it can be safely left out of the mixture, because of its rather low atmospheric concentration and close relationship to *Alternaria*.

In general, it may be said that a positive reaction to *Alternaria* necessitates the inclusion of that extract for treatment in almost every part of the United States.

If there is a strong or moderately strong reaction to *Hormodendrum,* it, too, should be included, since it is highly antigenic and is present in the atmosphere in large numbers. If the case at hand presents a reasonably well-marked case of seasonal mold allergy, in most instances the treatment mixture will require at least 50 per cent of *Alternaria* and *Hormodendrum,* with the other half made up of reactors to other molds and smuts. The usual case presenting mold allergy will be found to respond favorably to equal parts of *Alternaria* and *Hormodendrum,* although frequently *Aspergillus* will be found to be necessary. In the event that a complex mixture appears indicated, the judgment of the clinician is often severely taxed. The seasonal occurrence, geographical location, atmospheric concentration and degree of cutaneous reactivity to the tests will all be called upon to formulate a proper proportion of causative mold antigens in the treatment mixture.

As has been indicated previously, mold-sensitive individuals often react to house dust. In this Clinic, when the patient exhibits nonseasonal symptoms of any degree and there is a positive reaction to house dust, dust extract is included as a part of the course of treatment.

Hyposensitization treatment should be instituted as soon as the diagnosis has been made, regardless of the season of the year.

Rapidity of treatment will depend in a large measure upon the imminence of the mold season for the particular individual. In general, a perennial treatment plan similar to that widely used for hay fever patients is no doubt the most successful. In this Clinic, a mixture of the mold extract in a dilution of 1 to 10,000 is administered, starting with .05 to .1 cubic centimeter. Usually the dose is increased .1 cubic centimeter at five to seven-day intervals until .5 cubic centimeter of the concentrated solution is well-tolerated. Usually this constitutes a maintenance dose, although no hard and fast rule can be adopted. In many instances the dose may be decreased and the patient satisfactorily maintained on a dose of .2 cubic centimeter of the concentrated extract at two to four-week intervals. Only by careful individualization can a program be outlined. House dust extract is administered concurrently whenever it appears to be indicated. The dosage is the same as for mold extract, and, if desired, may be combined with the mold mixture.

The success of specific treatment in mold allergy is well-established. Numerous investigators report excellent results in from 75 to 85 per cent of cases. The physician may expect results equally as good as in cases of pollinosis if the diagnosis is correct and the treatment mixture properly balanced.

SUMMARY

The air-borne spores of common fungi constitute one of the causes of allergic disease. The most frequent manifestations are rhinitis and asthma, but other allergic effects such as dermatitis, migraine, conjunctivitis and gastro-intestinal reactions are known to occur. The molds of prime importance are *Alternaria* and *Hormodendrum,* although some of the less common offenders must be regarded with suspicion. Mold allergy is recognized clinically by the history of summer occurrence not coinciding with the pollen season and by frequent exacerbation when the patient is near hay or straw. Nonseasonal mold allergy may occur.

Treatment can be expected to yield a high degree of satisfactory results, especially if the entire allergic study is carefully correlated. Mold and house dust hyposensitization should be utilized where indicated, together with proper management of pollen sensitivity, food sensitivity and miscellaneous inhalant sensitivities. Experience indicates that the best results are obtained with the perennial method of treatment.

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Allergic Skin Disorders in Pediatrics*

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Allergic skin disorders in pediatrics cover a very wide field. Although allergy plays a greater or lesser role in most skin diseases, especially infectious disorders, custom has restricted the term allergic dermatoses essentially to three groups:

1. Eczema - Dermatitis
2. Urticaria
3. Drug Eruptions

These are the same allergic skin conditions which also plague the adults. But the same disorders frequently look and react different during infancy and childhood. We are all familiar with the differences in reactions, preferences and locations of the same disease in childhood and adult life; although the reasons are far from being understood. Ringworm is perhaps the best example of a different behavior of a skin disease in the child and in the adult. It is well known that the superficial form of tinea capitis occurs almost exclusively in children *before* puberty. Recently Rothman [5] has demonstrated that the hair of the scalp of the adult contains some fungicidal fatty acids which are lacking in the hair of the child. In allergic skin diseases the differences between child and adult are perhaps just as great, although not so apparent.

There is another special aspect of skin diseases in children. The association of skin disorders with changes of the general organism is more obvious. General health, state of nutrition, anemia, rickets, vitamin deficiencies play a still greater part in skin disorders in children than in grownups.

Infantile Eczema

The most difficult skin problem of the pediatrician is infantile eczema. It is also one of the most difficult tasks for the dermatologist. However, with proper treatment, with an open mind and interest on the physician's part, and a desire for cooperation on the parents' side, most cases can be managed satisfactorily.

When we speak of infantile eczema, we mean all forms of eczema or dermatitis occurring in infants below two years of life. Customarily we distinguish the following groups shown in Table 1:

Table 1

Diagnosis	No. of Cases Observed Between 1937-1948
Atopic dermatitis	247
Seborrheic dermatitis	93
Contact dermatitis	108
Infectious eczemas	18
Miscellaneous eczemas	21

It is not always possible to distinguish the various entities clinically. This is especially the case when the face alone is involved. For some, yet unknown, reason, infants respond frequently with an exudative dermatitis especially on their face regardless whether this may be an atopic, a contact, or seborrheic dermatitis. Furthermore, two or more forms of eczema may be combined. Most frequent, apparently, is a combination of atopic dermatitis and seborrheic dermatitis.

In spite of these difficulties, the experienced physician usually will be able to distinguish the various forms correctly. This distinction in many cases is important for correct management of the case. Atopic dermatitis, also called allergic eczema, is the most common form of infantile eczema. Among the 546 cases seen by us during the last twelve years (see Table 1), 247 were diagnosed as atopic dermatitis. Most cases presented the pure form, some suffered from a combination with other forms of eczema such as seborrheic dermatitis, or contact dermatitis. Furthermore, there were 57 instances of infantile eczema which might have been atopic, but could not be classified definitely.

Infantile Atopic Dermatitis

In many instances, this form of eczema starts around the second to the fourth month. This condition frequently presents a typical picture. The face is nearly always involved. We find an acute, at times weeping dermatitis, with swelling of the cheeks that may extend to the ears, scalp, and neck. In severe cases, the eczema is covered with yellowish and bloody crusts showing marks of severe scratching. The rest of the body is frequently involved and often shows patches of sharply outlined dermatitis that are more or less infiltrated. Favorite locations are the arms and legs, but the whole body may be afflicted. On arms and legs it may turn into a diffuse severe dermatitis, but usually less acute than the face. Signs of scratching are always present.

Infantile atopic dermatitis is one condition where skin tests are of very great help, especially in the severe cases. Scratch tests are the method of choice. Where feasible, passive transfer is recommended; this method is preferable to intradermal testing in babies. In my experience, scratch tests are helpful in determining the offending allergens in nearly three-fourths of the cases of severe infantile eczema.

Many infants with atopic dermatitis present a positive scratch test to eggs, even if they never ingested this food. It is believed that this sensitivity is transmitted from the mother. This reaction does not necessarily mean that the child is allergic to eggs. However, it classifies the child as an atopic individual. Excluding the whealing reaction to egg, about one-fourth of these infants will react to foods, one-fourth to environmental allergens,

* Presented at the Continuation course in Pediatrics, University of Minnesota Center for Continuation Study, April 7 to 9, 1949.

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and one-half to both. It is said that during the first year of life, foods only have to be considered. This concept needs revision. Our experience shows that, in a rural area at least, environmental allergens are just as important as causative allergens as foods, even during the first six months of life.

These tests allow us to map a better plan. Or course, tests have to be interpreted properly. Although positive scratch tests are often significant, a positive reaction to dust may not be connected with the child's eczema, but with the accompanying rhinitis. And a perfectly negative test does not exclude sensitivity. This holds true especially for foods. For example, I have seen a number of instances of sensitivity to orange with repeatedly negative skin tests. In my clientele—disregarding the reactions to egg—wheat ranks first as reactor in infantile eczema, potatoes next and milk as a third. In regard to environmental allergens, cattle and horses are on top of the list, followed by house dust and feathers. This is not surprising, as about one-half of my infants with infantile eczema are farmer's children.

Treatment of Atopic Infantile Eczema

After reading the history and examining the child, it is essential that an explanation of the situation be given the parents. This is the real eczema. The parents cannot expect a "cure" like in ringworm. There is no magic formula. The possible later association with asthma and hayfever must also be explained, especially if there is a family history of these conditions. Of course, this should be done without frightening the parents unduly. The difficulties to be encountered should not be kept from them. There is consolation, however, for infantile eczema is not a very serious disease in regard to life, and most cases can be managed satisfactorily, including their later asthma and hayfever.

Local treatment: All irritation should be avoided. The eczema should be treated according to the stage—acute, subacute or chronic and whether it is secondarily infected or not. The principles which apply to the treatment of dermatitis in general also go for infantile eczema. In the acute phase, bland treatment is indicated, wet compresses with aluminum acetate, soda or chamomille. The use of wet dressings in infantile dermatitis has recently been discussed thoroughly by Perlman.[4] In case of secondary infection, potassium permanganate 1:9,000 may be used. The use of boric acid, both as a solution or an ointment, is frowned upon by some because of the toxic qualities of boric acid (Watson[8]). When wet compresses are applied to a baby, it must be watched constantly, especially if the baby is tied down and the compresses applied to the face where the cloth may lead to obstruction. Even in the very acute phase, a wet compress can at least be alternated with mild ointments or a zinc oil consisting of 40 per cent zinc oxide in olive oil or corn oil.

Ichthyol	2.4 gm.
Zinc oxide	48.0 gm.
Olive Oil or Corn Oil q.s. ad	120.0 cc.

Where the eczema is drier, a more greasy ointment containing equal parts of vaseline and eucerin with 3 per cent liquor burrow is applied.

In the presence of infection, an antiseptic should be incorporated—ammoniated mercury 2 to 3 per cent, or rivanol 1 per cent. Penicillin or sulfonamides as an ointment is not indicated. If the secondary infection is severe, it is advisable to use parenteral penicillin. Usually relatively small amounts are sufficient. One to two per cent aqueous solution of gentian violet is of great help in reducing the secondary infection and drying up the skin. It is a messy procedure, but a good standby.

In contradistinction to adults, tar may be used in infantile eczema rather early. It is applied either in zinc oxide ointment, 3 to 5 per cent, or sometimes as crude coal tar. Both preparations can be tried where the eczema is still rather acute, especially if it does not respond to the milder preparations. Tar is toxic and therefore should not be used over too great an area at a time. In milder cases tarlike substances, such as Naftalan or Dernaftan, are helpful:

Naftalan or Dernaftan	1.5 to 3.0
Castor oil	6.0
Lassar's paste ad	30.0

S.—Apply and bandage.

Three per cent ammoniated mercury in zinc oxide ointment is often helpful in milder cases.

Contrary to general opinion, soaps and baby oils are often tolerated, and only at times irritating. In this instance the modern sulfonated oils may be substituted for soap, and castor oil—externally—as a mild lubricant.

General Measures

First of all, a thorough examination, including a complete blood count and urinalysis, should be done.

A child with infantile eczema must be considered and treated from every possible angle. The following are our routine measures for all more severe cases of infantile eczema:

Multibeta	15 to 25 drops t.i.d.
Drisdol	10 drops b.i.d.
Ascorbic acid	50 mgms. daily
Elixir feosol or fergon	½ to 1 teaspoonful t.i.d.

The following measures are used as indicated:

Phenobarbital gr. ⅛ to ¼ t.i.d. as needed and according to age.

Elixir benadryl 1 to 2 teaspoonfuls q.i.d., or Elixir pyribenzamine ½ to 1 teaspoonful q.i.d. or some other antihistaminic.

Crude liver extract 1.0 cc. every other day, when progress is slow.

Amino acids

General ultraviolet treatment, but protect areas treated with tar, as tar is a photo sensitizer.

Lard, in stubborn cases.

My personal experience with lard is very limited. But the experiences of Finnerud, Kessler and Wiese, and of Hansen,[2] reveal that over one-half of the patients with intractable eczema are greatly benefited by the dietary

inclusion of fats rich in the unsaturated fatty acids. In most of the recent studies, fresh lard has been the source of fat. Most patients appear to have little difficulty in taking lard in teaspoon or tablespoon quantities, although some prefer to take it with salads as dressings, on cereals, or as a spread on crackers, toast or in sandwiches. It is felt that a therapeutic trial should comprise a period of about two months or so, using one to two ounces per day. At the present time, it appears that this regimen should supplement but not substitute for a careful allergic work-up and the use of local therapeutic measures.

Psychological Treatment: These children frequently come from high-strung and nervous parents. The parents should be instructed to give the children adequate care, and allow them as much rest as possible. The child may need sedatives to begin with, and so may the mother. The children should have the loving care of the mother or nurse, but should not be spoiled; they should not be taken up every time they cry.

Allergic Management

Most important is elimination of offending contacts. Skin tests act as an excellent guide. Whenever dust sensitivity seems important, a regime as dust-free as possible is recommended. Wool is a frequent irritant, probably not always on an allergic basis. The following instructions are given to the parents:

Instructions for Infantile Eczema

"Please prepare for the child a room as dust-free as possible according to the program you have just received. Remove the feather pillow as the child does not need a pillow at all.

"Be very strict to avoid contact with wool as much as possible. Fuzzy wool is worse than smooth wool. There should be no woolen rugs where the baby plays. Put on a washable cotton dress when handling the baby. Try not to handle the baby while wearing your wool coat.

"Do not allow other members of the family or friends to fondle the child while wearing their overcoats or working clothes as they may carry dust from the working place or the barn with them.

"As far as the child's own clothing is concerned, put on woolen garments only when necessary. If you dress the child in a woolen snow suit, be sure to have long cotton sleeves and long cotton stockings underneath. Do not let the child wear the snow pants inside the house.

"Do not allow the child to play on the mohair furniture or on the rugs in the living room. Yet try to let the child live a life as normal as possible.

"The child should have a normal diet according to the age. Keep chocolate, nuts, pickles, sour foods, and sea foods away from the child and those other foods which we have eliminated in this particular case. Do not restrict the child's diet more than necessary.

"The child should have the loving care of the parents, but should not be spoiled. Do not worry about the child's eczema. Nervousness and upsets on the part of the parents will also upset the child.

"You may expect a flare-up of the eczema when the child cuts a tooth or gets a cold. If the child does not get along as well as expected, notify your doctor."

In regard to diet, the severe cases are placed on a strict elimination diet, consisting of evaporated milk, oatmeal, carrots, and pears.

This diet is used only in severe cases, usually hospitalized. Such a restricted diet is enforced only for a short time, and always supplemented by vitamins, iron, etc. In milk sensitive patients a soybean preparation is used instead of milk. Probably goat milk can be substituted in some cases sensitive to cow's milk. As soon as there is improvement, more foods may be added. In ambulatory, milder cases, a less rigorous diet is permissible. Before using a strict diet, we eliminate those foods which are incriminated by the history or the skin tests, and also common offenders. Wheat, potatoes, chocolate, nuts, fish oil, citrus fruit, and all fancy foods are removed from the diet.

When the child is well or nearly so, we try to add the allergic or suspected foods very gradually.

In regard to dust sensitivity, I have tried desensitization only in recent years. There have been promising results in some severe cases. Dosage must be watched. The 1:1 million dilution or less is recommended for a start. If there are reactions, dilution ten times weaker is used. Desensitization in atopic dermatitis seems even more difficult than in asthma. It should probably not be a routine procedure.

We do not urge hospitalization of a patient with infantile eczema except in the presence of severe secondary infection, or some other complication such as Kaposi's varicelliform eruption, bronchitis, pneumonia. Hospitalization is not without danger. Most babies with infantile eczema acquire some upper respiratory infection, if one is not already present. But with good care, penicillin and sulfonamides, fatalities are now avoidable. The child is placed in a room as dust-free as possible. The same nurse usually takes care of the baby. External irritations are avoided. Visitors are excluded whenever possible.

It is usually not difficult to clear up most cases of infantile eczema at the hospital. The real test, however, is to keep the infant in good condition after it returns home. Where environmental allergens play a role, the parents are instructed to prepare conditions as dust-free as possible. Where certain contacts cannot be avoided completely, for instance cattle dander on a farm, the parents are advised to move the infant away from the farm for another four to six weeks. If a child is kept away from environmental allergens for a period of about two months, the sensitivity seems to decrease to some degree so that minor unavoidable exposures later on usually are tolerated without much trouble.

Infantile Seborrheic Dermatitis: Infantile seborrheic dermatitis is characterized by relatively sharply outlined patches of a round or oval contour measuring from 2 to

5 cm. in diameter. They show a yellowish color. Favorite locations are the face and arms, but they may occur on any part of the body. There is usually a dry scaly dermatitis of the scalp present, the so-called cradle cap, or a history of its prior existence can be elicited. Lesions of seborrheic dermatitis may occur also in the folds and then become more moist and give rise to a mistaken diagnosis of atopic dermatitis. However, there are no scratch marks in pure seborrheic dermatitis.

General examination of the severe cases frequently brings out some underlying systemic condition such as malnutrition and secondary anemia. Treatment with usual doses of iron and large amounts of vitamin B complex frequently is beneficial without any change of the local treatment. Locally, 2 per cent ammoniated mercury in zinc oxide ointment is all that is needed. In more stubborn cases, sulphur as a 30 to 40 per cent paste in vaseline or coal tar 1 to 3 per cent in zinc oxide ointment are helpful. General ultraviolet treatments may be used in resistant cases.

Infantile Contact Dermatitis: Contact dermatitis in the infant is probably less frequent than generally assumed. Dermatitis from sensitivity to local medication does occur; usually it can be easily tracked down. Baby oils, soaps, and powders may also be a cause of contact dermatitis, but not a very frequent one. If the face is involved, distinction from atopic dermatitis may be difficult or impossible. However, there is usually a more sudden onset in contact dermatitis.

There exists a rather peculiar form of dermatitis in infants which probably also belongs to contact dermatitis. This is a papular dermatitis occurring mostly on the legs and buttocks and starting around the age when a child begins to creep around on the floor or the porch or outdoors. It is also seen on the arms, and usually consists of relatively hard papular lesions which become confluent and may turn into an acute weeping dermatitis. The cause usually cannot be determined; the eruption takes its own course, lasting for about three to eight weeks. It occurs mostly in spring and early summer. Local treatment with a mild ichthyol lotion alternating with bland softening ointments is often all that is needed; in debilitated children, cod liver oil, iron, vitamin B complex or light treatments are indicated.

Infectious Eczema: Infectious eczemas, mycotic, bacterial and parasitic (scabetic forms) constitute the smallest group of infantile eczemas. The more common form is intertrigo. Intertrigo is manifested by eroded, usually more or less sharply outlined patches of eczema in the folds along the neck, axillae, and groins. It is a form of infectious eczema, partly of bacterial origin (streptococcus or other bacteria), partly of fungus nature (monilia or other yeast-like fungi). Heat and moisture and the ensuing maceration are important contributing factors.

Eczema in the Older Child

In children between 2 and 14 years the distribution and the frequency with which the various forms are encountered are different from those in infants, and become more similar to what we find in the adult population. Contact dermatitis becomes more prevalent.

There are, in childhood, some other forms of eczema which are more difficult to classify. A condition called prurigo, with pin-point to pin-head sized itching papular lesions, is frequently found, especially on the extensor surfaces of the arms and legs. There might be a very severe pruritus connected with it. There may be also scattered lesions on the body and on the buttocks, and the picture may be suggestive of scabies. As a rule, this form of dermatitis is not scabies but one of the following three conditions:

First, it may be a manifestation of an atopic dermatitis.

Second, if there is a history that the eruption occurs usually in winter, and is aggravated by wearing wool or especially part-wool underwear, and if it is associated with a dry skin, the chances are this is the "winter itch," prurigo hiemalis. This condition is much more frequently encountered in adults in the cold dry climate of the northern mid-western states. It is seen, however, also in children. Vitamin A, 100,000 units daily, and a mild greasy ointment are usually helpful. Excessive bathing and use of soap should be avoided.

More frequent and perhaps still less known is the third causation: prurigo due to pinworm infestation. In this condition scattered scratched and papular lesions on the body are usually found, also on the extremities, especially thighs and, most suggestive, on the buttocks. Here lesions frequently are excoriated. This picture is usually mistaken for scabies, especially as more than one member of the family may be afflicted. A search for pinworms is usually successful, and treatment of the pinworm infestation usually clears up the condition. Antihistaminics at times relieve the pruritus quickly; an antipruritic lotion such as the following is applied externally:

Ichthyol	1.2
Zinc oxide	6.0
Calamine lotion ad	60.0

½ to 1 per cent menthol or phenol may be added. The addition of 5 to 10 per cent calmitol is preferable, if the pruritus is more severe.

Another form of eczema so frequently overlooked is the "scabetic eczema" in children. These cases do not present the typical picture of scabies. They show more or less severe eczematoid lesions on the hands with secondary infection, roundish patches which resemble seborrheic dermatitis on the arms and body. To the experienced examiner there are enough scratch marks on the body to suggest the presence of scabies. Not infrequently there is a history that there was scabies in the family, and that the child had been treated for scabies.

The diagnosis is difficult because often one is not able to find a burrow which will yield the mite or its eggs. There is reason to believe that these eczemas are not just due to secondary infection or contact dermatitis from medication but may represent true sensitization to some substances of the scabies mite.

These cases are much more difficult to treat and usually require at least two or even more courses of treatment. The milder antiscabetics are of no help.

Kwell, which can be used in the presence of secondary infection and eczema, offers promising results. If the usual treatment doesn't help, these cases can often be treated with an old-fashioned sulfur and balsam of Peru ointment of the following composition:

Sulfur praec.	5.0
Balsam of Peru	8.0
Castor oil	12.0
Vaseline ad	60.0

This ointment is applied for three nights all over, except the face. On hands and wrists it is used for a week longer, also on the ankles, if necessary. The eczema is treated afterwards with tar and x-ray treatments, if it proves more stubborn.

Urticaria

Urticaria in children is usually less difficult a problem than in adults. The clinical picture is the same; in most instances we have only hives, but angio-neurotic edema may accompany more severe cases.

Three types are the most common: *Urticaria in infancy*: A child with atopic eczema suffers from attacks of urticaria. Frequently the mother is able to tell the story and traces it to a food. Ingestion of the food is by no means necessary. One instance is that of a severely wheat-sensitive infant with infantile eczema. Whenever the mother sifted flour in the kitchen, the child became itchy and the urticaria appeared.

Then there is the *occasional or acute type of urticaria* in children of any age. Frequently there is a history of a previous, often milder attack. These cases of acute urticaria are usually on an allergic basis, mostly foods or drugs; however, contactants such as silk, wool, feathers, may also cause hives. A careful history is most important. It is surprising to find how many more cases of urticaria turn out to have an allergic background, when the investigation becomes more thorough. Often it is not possible to find the responsible food at the time of the first attack. It may be some fish, nuts in a candy bar, peaches, strawberries, or some other fruit or vegetable. By alerting the mother to the possible causes and by keeping track of the child's diet, the parents themselves may present one with the solution when the child suffers another attack.

Among the drugs that cause hives in childhood, cough drops rank first in my experience, whereas in adults the favorite drugs to produce urticaria is aspirin. The search for an offending drug is often more difficult than that for a food. One must explain what one means with the word drug or medicine. Cough drops are not even considered that. In some cases there is a history of an upper respiratory infection. The mother is inclined to incriminate the sulfonamides or vitamins the child received from the family physician, but more often it is the cough drops.

The treatment of this allergic urticaria is rather simple now: Avoidance of the allergen, if it has been identified or suspected; a mild laxative, to remove as much as possible of the causative factor. Even so, the urticaria may linger on for several days. Small amounts of adrenalin will produce immediate relief. The antihistamines, pyribenzamine, benadryl, histadyl or others will relieve the urticaria and especially the itching until the other measures become effective. Local treatment is not of great value. A hot bath may bring out the hives more, and afterwards help to a better rest at night. Calamine lotion with or without phenol can be applied, and will divert the mind of mother and child from the trouble. I always like to give some calcium. Don't forget sedation for the child and the parent where this seems necessary.

Physical allergy, urticaria from sunlight, heat or cold is rather rare in children. Antihistamines are useful in such cases.

But there is *another* form of urticaria in children. When these patients are seen, the urticaria has been present for a few weeks. The attacks are daily, or nearly so, but there is no rhyme or reason. Some days are much better, then there is a severe new eruption. Often this form of urticaria can be traced to an infection, usually of the upper respiratory tract. Elimination diets, avoidance of drugs does not help. Treatment of the underlying infection with sulfonamides or penicillin is usually successful. One has to be familiar with this form of urticaria, because it becomes embarrassing when these children are subjected to all forms of allergic management. Bivings [1] has again called attention to it. Speaking of infection and urticaria, one must always remember that scabies and insect bites, bedbugs and others, may cause urticaria.

These insect bites bring to the mind a dermatosis which is usually discussed with urticaria, although it is a different disease, called lichen urticatus, but also known as papular urticaria or strophulus.

This common disease of childhood is characterized by small wheals which subside in the course of a few hours and leave hard itchy papules, papulovesicles or occasionally small bullae. Hüllstrug [3] believes that lichen urticatus may be caused by various single or combined factors. External factors such as foods and insect bites, and internal allergens, for instance, from intestinal parasites, may play a role. Allergic investigation is usually negative. Some of the children with lichen urticatus are atopic individuals; but the positive reactions elicited do not seem to bear any relationship to their condition. Insect bites, for a long time, have been suspected. Recently Shaffer et al.[6] brought good evidence for this etiology.

However, not all cases of lichen urticatus are due to insect bites. In some, food allergies appear to be a factor. Treatment of these cases of lichen urticatus is difficult. Elimination diets are not too helpful. General hygienic measures are recommended. Antihistaminics should be tried. From my experience with lichen urticatus in adults, I would consider also a trial with hapamine (histamin-azo-protein).

Drug Eruptions

Drug eruptions in children, besides urticaria, probably did not play too great a role or did not receive enough attention until the advent of sulfonamides. Then the practitioner and the pediatrician became aware of them. It is not only the sulfonamides and penicillin that may cause these rashes. Any and every drug may do that.

When a skin eruption looks strange or odd so that it does not fit into a given category, or if it shows simultaneously signs of different dermatoses, think of a drug rash, especially if this rash develops while the patient is under your care. It may look like measles, scarlet fever, or erythema nodosum, or acne, or erythema multiforme. But if one looks more closely, it does not look exactly like one of these conditions—measle-like, but no Koplik's spots, and perhaps an urticarial component which is not seen in measles. Another case may look like erythema multiforme at first sight, but the experienced observer notices a brownish pigmentation. This is not encountered in true erythema multiforme, but is very suggestive of an erythema-multiforme-*like* drug eruption.

Pediatricians have an easier job in finding out what drug was the cause, because children usually take fewer medicines. Sometimes there is only one, according to the history. A check list of the common drugs and home remedies comes in very handy at times.

In the hospitalized child that has taken a number of medications usually it is something either taken within 24 hours preceding the eruption, or a drug which was started six to nine days earlier. In this latter instance, the child has *become* sensitized to a new drug; in the former instance, the child is sensitive to a drug he or she has had *before*. Sometimes a history will reveal some previous, milder experience of intolerance to this drug.

There is another clue that may help in finding the culprit. Although any drug may cause nearly any form of an eruption, there are definite patterns preferred by certain drugs. Aspirin, for instance, is likely to produce a scarlet fever-like eruption, bromides, acneform lesions. A thorough discussion of the various forms of eruptions caused by different drugs has been given by Sulzberger and Baer.[7]

One form of drug sensitivity which is rather little known outside dermatologic circles, although Brocq described it more than 50 years ago is the so-called *fixed drug* eruption. In this condition usually only one or two erythematous spots occur, and always in the same location. The hands, wrists and the genital area are preferred. But they may appear on any part of the body. Sooner or later, the center becomes pigmented, and then the diagnosis is practically sure. Antipyrin, phenacetin, and phenolphthalein are probably the most common drugs causing these fixed eruptions.

Most drug eruptions are on an allergic basis. That usually means that the drug should be withdrawn. When the drug is continued through necessity, often nothing happens. The incriminated drug may have been innocent. The rash was blamed on the sulfonamide, whereas actually it was caused by the barbiturate or codeine, which the child had received earlier, and which had been stopped before. Or the "drug eruption" may have been on a different basis. We do know that some drugs may provoke a toxic eruption in a different way. Somehow antiseptics and antibiotics may stir up a latent infection and in this way produce a measle-like rash or an erythema nodosum-like eruption. In such a case, the drug usually can be continued with impunity.

There is still another possibility that applies especially to penicillin. Treatment with this drug can at times be continued without much trouble in spite of the presence of an urticarial type of sensitivity, especially when antihistaminics are given simultaneously.

These occurrences should not make one less conscious of the dangers of drug eruption. Fatalities have occurred from drug sensitivities. Disastrous results have been seen at times when the drug was continued. At present we may choose from such a variety of antibiotics that it should be nearly always possible to substitute another drug for the suspected one. At times part of the alarming condition, such as a high fever and prostration, may be due to the patient's drug sensitivity and not to his original disease.

The drugs should be eliminated wherever possible. Desensitization, except perhaps in the case of penicillin, is not a practical procedure. Symptomatic treatment consists of antihistaminics, fluids, and general measures as indicated.

I have tried to present a few phases of allergic skin disorders in pediatrics. The management of these cases, especially the eczemas, is usually difficult, often time-consuming and sometimes disappointing. The results are not perfect, and not always what we would want them to be; but in many isntances we can accomplish something worth while if we give the proper attention and time to these disorders.

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The Antihistamine Drugs in the Treatment of Hay Fever in the Adult

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From the time that Hippocrates in the fifth Century B.C. described what is today recognized as a food allergy to cheese, the interest in all phases of allergy has been of great and of increasing importance. It was, however, not until 1565 that Botallus of Pavia[1] described seasonal vasomotor rhinitis elicited apparently by smelling roses. To this day hay fever is often called by the laity "rose fever." For the first time in medical literature John Bostock[2] in 1828 mentioned the term hay fever. He reported on 28 patients suffering from "summer catarrh" and noted that the symptoms were elicited by hay. In 1831 Elliotston[3] called attention to the fact that patients had the idea, probably correct, that their catarrh was caused by grasses. Swett[4] in 1852 described both summer and autumnal types of hay fever in the United States. Outstanding above all others in the field of hay fever, however, is the figure of Charles H. Blackley.[5] It was he who in 1873 said that pollen catarrh was really a more appropriate term than hay fever and established the positive skin scratch tests with adequate controls.

In 1910 Barger and Dale[6] isolated histamine beta imidozolethylamino from ergot and in 1911[7] found histamine in the intestinal mucosa. Its precursor, histidine, is a common cell constituent. Best and McHenry[8] reported it is found most often in barrier tissue such as skin and intestinal mucosa. Histidine may be converted to histamine by the removal of carboxyl group not only by antigen antibody reaction but also by bacterial action.[9] Dr. R. Bieter notes that histamine tends to act on cells that are ennervated by the autonomic nervous system.

Histamine is known to produce constriction of smooth muscle, dilation and increased permeability of capillaries and to act as a secretagogue on the glands of exocrine secretion. It appears in the blood immediately after administration of an antigen, and in the guinea pig the phenomenon of anaphylaxis and the administration of histamine seem to be identical.[10]

While as pointed out by Dragstedt[11] histamine release is at least a major factor in the causation of allergy symptoms, it is probably not the only factor. It is because of this that Sir Thomas Lewis[12] called the factor "H subtance," and said, "I shall speak of an H substance, and in using it shall mean any substance or substances liberated by the tissue cells and exerts on the minute vessels and nerve ending an influence culminating in the 'triple response.'" The relationship between the amount of histamine activity in the blood and the symptoms is not as direct as one would desire. The identification of histamine itself in the blood, Dragstedt has repeatedly pointed out, is always difficult. As Katz[13] has shown, there is always the problem of differentiation between histamine bound to cells and histamine in the free state. He[14] added horse serum in vitro to the blood of a rabbit sensitized with that serum and noted that the cell-free plasma showed a great increase of histamine. Rose and Brown[15] got essentially the same results and repeated the experiment with use of egg albumin added to the blood of egg sensitive rabbits with the same effect. While we thus have evidence from these experiments as well as others[16,17] that there is a transfer of the bound to the free state, we as yet do not have definite evidence that the reverse is also true. There are indications that it is.[16] This change in the state of histamine makes it hard to assay its exact role in allergy. In the main, however, the histamine theory is plausible.

In discussing the treatment of hay fever, it would seem appropriate here to give a concept of what takes place in the hay fever patient. As in all patients with allergic symptoms, we first must have the so-called "asthmatic state"—a state defined by Rackemann[18,19] as an inherited one in which a patient is more likely to develop these symptoms than do others in exactly the same environment. It is the condition which may be the background in which allergy in the usual sense can develop. We have, further, the capacity in these individuals to develop sensitiveness and to produce or react to H substance so as to cause a variety of symptoms of vasomotor origin. In hay fever pollens acting on such a person whose eyes, nose and throat are sensitized causes the production of antibodies of two types[20]—a thermostabile and a thermolabile antibody. The reaction, we can postulate, of the thermolabile antibody and the pollen allergen causes the release of histamine or H substance which in turn causes the symptoms of hay fever. In this concept, it is easy to see that the logical point of attack would be the fundamental asthmatic state. Unfortunately we know so very little about that beyond the important hereditary factor which makes attack here very difficult. Indeed, it would seem at times that hay fever victims seem to have an affinity for each other, for misery loves company. Allergics seem to tend to propagate their heredity.

The next logical point of attack would be the allergen. Here again, though desirable, the economic and social factors make it frequently impossible to have the patient go where the pollen is not. Beyond that, the patient frequently becomes sensitized to other pollens. This factor was called forcibly to my attention on a recent visit to Mexico City. I met two Minnesota natives, doctors who had gone to live in Mexico City because of their severe hay fever. After a few years there, ragweed pollenosis had been replaced by an equally distressing pollenosis due to Bermuda grass pollens. Ragweed is present in

the vicinity of Mexico City, but the amount is extremely small. Again, two years ago while visiting at the University of Havana, I met a native Iowa allergist who informed me that his hay fever of Iowa due to ragweed had been replaced by a pollenosis due to grass pollen which is found in the air of Cuba in varying amounts throughout the whole year. These people are taking hyposensitization with good results, but they could not get away from their primary allergic state by getting merely away from the original offending pollen.

In 1911 Noon [21] and Freeman [22] used specific active hyposensitization in hay fever by repeated injections of increasing amounts of allergen. In 1935 Cooke Bernard Hebald and Stull [20] first presented evidence for an antibody which could block the union of ragweed antigen with the ordinary neutralizing antibody, that is, there are really two antibodies in hay fever—the sensitizing thermolabile antibody destroyed by heat at 56° Centigrade and the thermostabile antibody not so destroyed. Lovelace [23] states that the amount of blocking antibody is proportional to the symptomatic relief following treatment. Cooke,[24] however, found that it is not, and it is true that frequently a high blocking antibody titre does not always accompany good clinical results. It is equally true, however, that adequate hyposensitization does give relief in a great percentage of hay fever patients. In our own experience, the larger the dosage used the better the clinical results.

There are two parts to the treatment of hay fever by hyposensitization—the particular extract used and the way it is used. The methods used in the series here reported is simple. Skin tests by the usual scratch methods are correlated with the history of onset of symptoms of the patient and a specific solution made for each. History is most important. A positive skin test to a pollen that gives rise to no significant symptoms when that pollen is present in the air can not be of too great clinical significance in spite of the positive skin test. At the present time, there are only two crude methods of selection; one is the history to indicate the date of onset of symptoms as accurately as possible and to correlate this date with the onset of pollenation. The other is a field survey confirmed by pollen slides to make sure that a particular plant is capable of putting sufficient pollen in the air where a particular patient is exposed to it. Where scratch tests did not confirm the impression of history and pollen survey, intradermal tests were carefully applied. When atypical in onset and duration or when conventional treatment had given unsatisfactory result, molds were incorporated in the extract. Molds, although not apparently as important in adults as in children and through a field wherein a tremendous amount of work remains to be done even as to identification, occasionally gave better results when used either together with the pollen extracts or by themselves usually in the form of alternaria, hormodendrum or aspergillus. The initial dose injected subcutaneously is usually 20 units using .00001 mg. of pollen nitrogen by the Kjeldahl method as the unit. The dosage was increased at 4 to 7 day intervals by 50 per cent, aiming at getting the 20,000 units or more before the patient's symptoms began. Dosage increases, of course, depend upon the reaction of the individual. The maximum dose was then continued throughout the pollen season unless reaction or symptoms so dictated otherwise. It was at times reduced when the season started. Where possible, treatment is continued throughout the year at reduced dosage, usually 50 per cent; i. e., usually 10,000 units.

Since histamine or H substance has been designated as a common denominator for allergic manifestations, it is natural that many attempts should have been made to find some substance which could inhibit all anaphylactic and allergic reactions by counteracting or neutralizing histamine, the end product of the allergen antibody reaction. The second method of treatment, therefore, here reported is with the use of some of the so-called antihistamine drugs. Antihistamine drugs or histamine antagonists have been defined by Earl R. Loew [25] and as Dr. Bieter points out, as drugs which diminish or prevent several of the pharmacological actions of histamine by a mechanism other than by the production of pharmacological responses diametrically opposed to those produced by histamine. In other words, these drugs antagonize histamine and prevent its action without producing any pharmacological actions of their own. As Gilman [26] points out, the antihistamines are really blocking agents, and the term histaminalytic would really be more appropriate. They prevent the histamine from gaining access to the receptor mechanism of the cell and exerting the characteristic effect. The incomplete results and varying results in allergic manifestations with treatment by the antihistamine drugs may be explained in part by the fact that histamine within the cell itself is not affected or the amount of histamine released is too great to be neutralized by the amount of drug given.

Hill and Martin [27] in 1932 listed 165 methods which have been used to attempt to inhibit anaphylaxis. Most were too toxic to use clinically. Among substances listed were atropine, barium, chloral, ether. Other substances used in the past decade—the amino acids—have been disappointing. Bovet [8] and Staub [28] in 1937 found two substances synthesized by E. Fourneau (hence the so-called F compounds) thymoxyethyldiethylamine and N:phenyl N ethyl N-diethylethylenediamine, called 929F and 1571F. These had marked antihistamine properties but were too toxic for clinical use. In 1942 Halpern [29] reported promising results with the new compound called Antergan. Since then extensive research has resulted in the production of a great many of these drugs until their number seems legion. A list of the more prominent antihistamines is as follows: (1) phenylamines—Antergan and Antistine; (2) pyridine amines—Neoantergan, Pyribenzamine and Trimeton; (3) thenyl, pyridine amines—Histadyl or Thenylene, Tagathen or Clorothen, Diatrin and Bromothen; (4) benzhydryl alkamine ethers—Benadryl and Decapryn; (5) pyridindene—Thephorin; (6) pyrimidine amines—Hetramine and Neohetramine; (7) phenothiazines—3015 Rhone-Poulene or 1627 Searle, 1721 Searle and Pyrrhoazote.

We have used these drugs both in hay fever and in other allergic conditions. Results in conditions other than hay fever will be reported at a later date. On the whole results with the use of these drugs in hay fever has afforded, according to the literature, relief of up to 94 per cent. In reviewing some of the extensive literature, it is apparent that the drugs resemble one another in degree and duration of relief.[30-39] The effect persists four to six hours and results are apparent in one-half to one hour after oral administration.

Side effects[34,40-43] have been many, and though not usually serious are annoying. Among the most common are sleepiness, dizziness, skin eruptions, epigastric distress, headache, change of shock tissue. A very important and interesting report on the use of these drugs in their less obvious effects is that of Haltkamp and Hagerman and Whitehead.[44] They report on the effects on the mental ability, reaction time, and minimum distance of two point discrimination. They report definite alteration in 50 per cent of college students. Blasman and Hagens[45] report a case of exacerbation of asthma with fatal result in the use of Benadryl. Here again the exact role of Benadryl is very difficult to evaluate as is the case of any therapeutic agent in asthma.

In the series of patients now being reported, all were seen once a week or oftener. Symptoms were recorded as were degree of relief and side effects. They were questioned as to nasal discharge, difficulty in breathing, itching, sneezing, increased flow of tears, smarting and redness of the eyes, wheezing, coughing and expectoration. New drugs were given as soon as evaluation was made. Dosage was prn and not at regular intervals. The results were evaluated according to the patients' own description and judgment and the overall picture including objective findings. Those who experienced 50 per cent relief or more were considered to have fair results. Patients who had mild to practically no symptoms were considered to have had good results. It was evident that this is at best a very rough method of assaying conclusions, but as in most conditions in which the subjective symptoms are very important, we must use as nonprejudicial an attitude as possible and keep all aspects of the condition under consideration in judging the figures given. It has been well said that there are three kinds of lies—white lies, black lies and statistics. Certainly in no field of medicine do statistics lie and lie and lie as frequently and as profusely and as efficiently as they do even in so simple a field of allergy as hay fever. This is understandably so, for here is a condition in which the statistics of results of therapy are affected not only by the usual enthusiasm of the investigator, not only by the psychosomatic aspects of the patients, but even by the very furniture and people by which the patient is surrounded, the food he consumes and the very air that he breathes.

Table 1

Hyposensitization—108 Patients

No Relief	*Appreciable Relief*	*Good Relief*
16 (14.8 per cent)	32 (29.6 per cent)	60 (56.6 per cent)

One hundred eight patients were treated by hyposensitization by method described. Of these as seen in Table 1, 16 (14.8 per cent) had no or very slight improvement, 32 (29.6 per cent) had appreciable relief where the patient thought treatment was worthwhile, and 60 (56.6 per cent) had good relief.

Table 2

Placebos—20 Patients

No Relief	*Appreciable Relief*	*Good Relief*
18 (90 per cent)	1 (5 per cent)	1 (5 per cent)

Twenty patients were given placebos. It is interesting to note as emphasizing the psychosomatic aspects of any allergic condition that one (5 per cent) had appreciable relief and one (5 per cent) had marked relief, though 18 (90 per cent) had no relief whatever.

Table 3

Benadryl—62 Patients

No Relief	*Appreciable Relief*	*Good Relief*
22 (35.5 per cent)	12 (19.3 per cent)	28 (45.2 per cent)

Sixty-two patients were given Benadryl in doses of 50 to 100 mg. up to four times a day as needed. Of these, 22 (35.5 per cent) had no relief, 12 (19.3 per cent) had appreciable results and 28 (45.2 per cent) had good relief of symptoms.

Table 4

Histadyl—22 Patients

No Relief	*Appreciable Relief*	*Good Relief*
7 (31.8 per cent)	8 (36.4 per cent)	7 (31.8 per cent)

Histadyl was given in the same dosage as Benadryl. Of 22 patients 7 (31.8 per cent) had no relief, 8 (36.4 per cent) had appreciable relief and 7 (31.8 per cent) had good relief.

Table 5

Pyribenzamine—55 Patients

No Relief	*Appreciable Relief*	*Good Relief*
17 (30.9 per cent)	16 (29.1 per cent)	22 (40 per cent)

As noted in Table 5 Pyribenzamine was prescribed to 55 patients. Of these, 17 (30.9 per cent) had no relief of symptoms, 16 (29.1 per cent) had appreciable relief and 22 (40 per cent) had good relief of symptoms.

Table 6

Most Favorable Drug—72 Patients

No Relief	*Appreciable Relief*	*Good Relief*
19 (26.4 per cent)	19 (26.4 per cent)	34 (47.2 per cent)

It would seem from summaries so far given that the percentage of patients relieved by these drugs are essentially the same, but it was evident that some were re-

lieved by one drug and some by another. There were differences in the amount and quality of the relief obtained. Therefore, 72 patients were given the opportunity to try different antihistamine drugs and use the one best suited to them. Of these, 19 (26.4 per cent) had no relief with any of them, 19 (26.4 per cent) had appreciable relief and 34 (47.2 per cent) had good relief. Though hard to express in figures alone, it was evident that by changing to various drugs and using different ones when one drug had less benefit or gave undesirable side effects, that better results could be obtained.

A very limiting factor in the use of antihistamine drugs since they were first used has been the toxic or side effects. While usually not too marked, they are often very annoying and limit their usefulenss in clinical practice. The effects vary in different patients for the same drug and often in the same patient with the same drug. Usually the larger the dose the greater the side effects in degree and frequency. There is fortunately no correlation apparent between the symptomatic relief and the side effects except insofar as larger doses may be required. The side effects are tabulated.

TABLE 7

Side Effects

	Benadryl	Pyribenzamine	Histadyl	Placebo
Drowsiness	36	12	4	1
Weakness	32	8	2	
Hypnosis			1	
Dizziness	18	5		
Urticaria			1	
Nervousness	6	6		
Nausea	2	5	2	
Vomiting	1	3		
Asthma	1			

As noted in Table 7 drowsiness was the most prominent symptom noted. This was a prominent factor in 36 patients of 62 taking Benadryl, in 12 of 55 taking Pyribenzamine, in 4 of 22 taking Histadyl and in one taking Placebo. Dizziness was a prominent action with Benadryl and Pyribenzamine while 6 patients of both the Benadryl and Pyribenzamine group complained of increased nervousness; weakness was noted particularly in the Benadryl group. Other side effects were hypnosis, urticaria, nausea and vomiting. We only had one patient in whom we felt that respiratory difficulty or asthma was apparently aggravated by Benadryl. Even here it is difficult to be certain as so frequently hay fever patients develop this complication who had never seen an antihistamine drug. I realize that change of shock tissue with development of asthma has been reported as a frequent side effect by some allergists, but this can not be too frequent. Certainly we have not had that experience in the adult patient. We must also realize that the antihistamines themselves may be antigens and cause allergic manifestations. The side effects were often combined in the same patient.

TABLE 8

Hyposensitization plus Antihistamines—108 patients.

No Results	*Appreciable Results*	*Good Results*
8 (7.4 per cent)	12 (10.2 per cent)	88 (82.4 per cent)

The patients who had been hyposensitized were given the drugs to use as needed for symptomatic relief. In this group, much smaller and less frequent doses were required to control symptoms. The incidence of side effects was practically nil. The very hypnotic effect was at night very desirable. There seemed to be no marked preference for any of the drugs, and at times one would seem to work better than another, while often in the same patient the same drug would have different results as to efficacy in relieving symptoms. In that case a change would have marked benefit. By combining the antihistamines with hyposensitization as noted in Table 8, only eight patients were unable to obtain at least some degree of benefit. It is interesting to note that practically all of the patients found it desirable to use the drugs at some time during the season—even those who had the best results with hyposensitization. In this group again, as noted, 8 (7.4 per cent) had slight or no improvement, 12 (10.2 per cent) had appreciable relief and 88 (82.4 per cent) had good results which in these cases were such as to make them very comfortable even to completely free them of symptoms.

COMMENT

A study of the results here given would indicate that the antihistamine drugs are a great help in the control of hay fever patients and would certainly justify the conclusion that histamine must play some very definite role in the allergic reactions. It is very evident also that the drugs here reviewed are a long ways from ideal. The side effects are a very real and serious obstacle, and often the patient changes one set of symptoms for another. The itching, nasal discharge and eye symptoms are much more relieved than the nasal stuffiness and blockage. The patients very often object to taking drugs continually through a long period of time, even though only seasonal. The results are purely palliative, and there is a recurrence of symptoms as soon as medication is stopped. They do not immunize the patient and protect him from the effects of an allergic reaction for any prolonged period. Beyond that, the effects are often very disappointing, especially in the severe cases. We have made attempts at various times to use benzedrine, caffeine, ephedrine to counteract the drowsiness of the large percentage of patients having this side effect but with no great success. In our experience, in instances where ephedrine was of benefit we found that the relief was better with no antihistamine at all.

The best results as noted are obtained not only in quantity but in quality which is difficult to express in figures, is by the combination of hyposensitization with the antihistamine drugs. The side effects, though not in direct ratio to the symptomatic relief, are very often in direct proportion to dosage used. It is, therefore, de-

sirable to use a smaller dosage which is exactly the case when used in conjunction with hyposensitization. It must also be emphasized that while the antihistamine drugs seldom have marked benefit on the respiratory or seasonal asthmatic symptoms, hyposensitization frequently will give marked relief of asthma even when the symptoms referable to the nose and eyes are little affected. While it is evident that we will get better antihistamine drugs as regards potency and toxicity, it is also evident that it would be preferable to attack the problem in a more fundamental way at the beginning rather than by neutralizing the end product of the allergen-antibody reaction.

Conclusion

In conclusion it is probably justifiable to say that the antihistamine drugs used here are a very valuable addition to our methods of treatment of hay fever but are often not efficient and have serious side effects. A large percentage of patients will get relief with one or another in an appreciable degree. The preferred method, however, at present is the combined method of hyposensitization with the antihistamine drugs. Here the results are the best up to the present period.

* * *

I wish to thank Dr. R. Bieter, Chief of the Department of Pharmacology, for his help in obtaining and using these drugs. I also wish to express my appreciation to Dr. S. Hirsh and Dr. W. Peterson for their help in administering some of these drugs and tabulating some of the data.

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Antihistamine Therapy in Allergy*

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THE recent development of the group of synthetic drugs known as "antihistaminics" is the result of several decades of theoretical and practical research in the field of histamine metabolism. A great deal of evidence regarding histamine points to its participation in the allergic reaction; yet much of this is indirect and based to a great extent on the close relationship that appears to exist between human allergy on the one hand and animal anaphylaxis on the other.

To review some of the pertinent data in support of the histamine hypothesis, it may be recalled that Dale and Laidlaw [1] were the first to point out the similarity between the toxic effects of histamine in guinea pigs and those of anaphylactic shock. Later, Lewis and Grant [2] while studying the minute vessels of the human skin remarked upon the close resemblance of histamine and allergic wheals. The experiments of Best,[3] Dragstedt, and others,[4,5] subsequently showed that histamine is a natural constituent of living tissues, where it exists in the cell in a bound, inactive form. It may be liberated as a result of antigen-antibody union, then becoming free to exert an injurious effect on the surrounding tissues.

Recognition of the probable importance of histamine in allergic disease stimulated a search for means of combating its injurious actions. Some of the principal pharmacologic actions of histamine are the contraction of smooth muscle, vasodilatation, increase in capillary permeability, and stimulation of secretory glands. Many of the manifestations of allergy are remarkably similar to these known toxic effects of histamine. Certain effects of histamine can be effectively counteracted by the specific pharmacologic action of such drugs as epinephrine, ephedrine, aminophyllin, and the iodides, which represent some of the most effective symptomatic remedies used in allergy.

The process of desensitization to the specific allergen indirectly combats histamine action by preventing the union of antigen and reagin through the interposition of a "blocking antibody." However, a more direct approach to the histamine problem has been sought. One method, which received widespread trial, attempted to increase the tolerance to histamine by immunization with histamine [6] or a histamine-protein conjugate.[7] This met with very little success. Another therapeutic method which has now been discarded was based on the use of the enzyme "histaminase." While this enzyme is capable of neutralizing histamine *"in vitro"*, it is ineffective under the conditions existing in the living organism.[8] The most recent and promising approach to the histamine problem is the development of chemical blocking agents, the so-called antihistaminic drugs, which are the subject of the present discussion. These compounds apparently produce their effect by displacing histamine from its receptor site on the cell through competitive action.[9]

The early work on synthetic antihistaminic agents was carried out in France, where for several years a systematic search was made for chemical agents capable of blocking the action of histamine in much the same manner that atropine opposes acetylcholine, or ergotoxine annuls the pressor action of epinephrine. In 1942 the first synthetic antihistaminic suitable for use in the human subject was introduced in France under the trade name, Antergan.[10] Its favorable effect in alleviating certain symptoms of allergy, gave added support to the histamine theory of allergic reactions, and spurred a more active search both here and abroad for new chemical agents which might be even more effective and less toxic.

Benadryl and Pyribenzamine were the first antihistaminic drugs developed by American chemists, and met with considerable clinical success. In Europe, Antistine and Neoantergan have now largely replaced the earlier drug Antergan, and these are being introduced into this country. Several other antihistaminics, the majority chemically related to earlier compounds, have recently been synthesized and made available for clinical use. Among these are Thenylene, also known as Histadyl, Thephorin, Decapryn, Neohetramine, Diatrin, Pyrollozote, Trimeton and Tagathen.[11] Their pharmacology and clinical action compare closely with those of Benadryl and Pyribenzamine.[12] They are effective in varying degree in the same conditions, and induce for the most part the same range of side effects. A certain number of the new drugs, however, appears to be much better tolerated, and may be used in those patients previously unable to take drugs of this type.

While many reports have appeared concerning the favorable action of antihistaminics in conditions not generally considered to be of allergic origin, the majority of these claims require further investigation and critical evaluation before they can be established. At this time it is quite well accepted that these drugs have great usefulness in allergic disorders. Their effect in these conditions, however, is limited. They do not help all types of allergic manifestations, and they do not necessarily benefit all individuals with any particular form of allergy. They are purely symptomatic agents having no permanent curative action, and rarely do they completely eradicate all the symptoms of an allergic attack. Yet they frequently induce a palliative effect in cases resistant to other therapeutic measures. They are exceedingly helpful in cases of urticaria, angioneurotic edema, dermo-

*Read at the 26th Annual Meeting of the American Student Health Association.

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graphism, and in those increasingly frequent "serum sickness-like" reactions which are seen following the use of penicillin, sulfonamides, horse serum, and other drugs and biologicals. The acute bouts of urticaria are generally more responsive to this type of medication than are the chronic cases. In these conditions, pruritus is frequently alleviated and edema diminished. Joint swellings, if present, remain more resistant to such therapy. The extreme pruritus of atopic eczema and contact dermatitis is frequently helped, and considerable benefit may be observed in some cases of pruritus ani and vulvae. Relief of itching is often noted in other skin conditions not necessarily allergic in origin.

Considerable discussion has resulted from the apparent benefit achieved in some of these pruritic skin conditions, since the evidence for histamine release in such situations is meager, or at least far less than that established for the whealing eruptions of the urticarial type. It is possible that these drugs may exert a favorable effect through other than an antihistaminic mechanism. They have other pharmacologic properties, among which is a strong local anesthetic action, several times that of procaine. Mayer [13] in recent work on experimental contact dermatitis in animals, observed an interference with hyaluronidose activity, and suggested this as a possible reason for the benefit observed in some skin eruptions.

In hay fever, a large percentage of patients obtain benefit from these drugs, though complete relief of symptoms is unusual. Rhinorrhea and itching of the eyes and nose are more often benefited than nasal blocking. More relief is usually noted early in the pollen season, and on days when the pollen concentration of the air is low. Later in the season, even in the presence of a diminishing pollen count, the beneficial response appears less. In general, mild cases of hay fever are benefited more than severe ones. Those who have received some degree of protection through desensitization therapy to the specific pollen obtain greater benefit than those totally unimmunized. In the more chronic condition of perennial allergic rhinitis, the incidence of favorable response is somewhat less than that observed in acute hay fever.

The action of these drugs in asthma is usually not striking. While some asthmatics note a beneficial effect, the majority fail to obtain appreciable relief of dyspnea from their use. A more favorable action, which occurs more frequently in children, is the relief of the asthmatic cough. Recently, aminophylline and ephedrine have been combined with antihistaminics, in the hope they may be of greater benefit to asthma patients. The simultaneous administration of such drugs to the asthmatic is often desired, and while such combinations offer greater convenience, we would hesitate to say from our own observations that any synergistic action occurs.

Experience with these drugs in miscellaneous allergic conditions, such as gastro-intestinal allergy and allergic headache have been quite variable. Certain cases obtain marked help, while other similar cases fail to attain any appreciable relief.

As previously mentioned, beneficial action of antihistaminic medication has been reported in many conditions in which an allergic component is absent, or is at least extremely doubtful. Among these might be mentioned, herpes simplex, scleroderma, dermatomyositis, transfusion reactions, dysmenorrhea, radiation sickness, morphine withdrawal syndrome, and the common cold. In relation to the latter it may be interesting to note in passing that there is some experimental evidence pointing to the increase of histamine content of the nasal secretion during the early stages of the common cold.[14] This aspect deserves further study and is receiving critical analysis in our own laboratory at the present time.

The usual mode of administration of these drugs is by the oral route. The drugs are rapidly absorbed from the gastro-intestinal tract, and destroyed or excreted within a relatively short period of time. The effect of a single oral dose is usually evident within 30 minutes and may last for several hours. From present knowledge at least, it would appear that the use of these drugs in the absence of active symptoms accomplishes little. Where symptoms are continuous, it is usually necessary to administer the drugs at intervals of 2 to 6 hours in order to maintain a palliative effect. The usual adult dose varies from 25 to 100 mgm. Some drugs are generally effective in smaller amounts, while others require larger doses. The individual response to these drugs is quite variable, and it is frequently necessary to give several doses before the requirements of the patient can be accurately gauged. Usually the drug is taken after meals since gastro-intestinal irritation is less when food is in the stomach. Children for the most part tolerate these drugs very well and may be given 25 to 50 mgm. doses. Elixirs and syrups containing 10 to 20 mgm. per teaspoonful have been found especially useful in infants, and in the occasional adult who requires smaller amounts or objects to the use of the pills or capsules.

It is sometimes desirable to administer antihistaminics parenterally.[15] Several drugs have been prepared in suitable form and at the present time Benadryl is generally available in sterile solutions containing 10 mgm. per cc. We have found it advisable, when giving Benadryl intravenously, to test the patient's tolerance with an initial dose of 10 mgm. and then to increase subsequent doses up to 50 mgm. depending upon the response obtained. The solution may also be injected intramuscularly, in which case the effect is slower and less intense. Subcutaneous administration is somewhat irritating, and occasionally produces local redness and swelling. Severe cases of urticaria and angioneurotic edema, and the serum sickness type reactions, who have failed to benefit from oral therapy, are often controlled by the parenteral administration of the drug. Marked to moderate sedation is often obtained with this preparation, and in an occasional case of asthma, relief of bronchospasm has been observed.

The local application of antihistaminics is occasionally beneficial in allergic and other pruritic dermatoses.[16] At the present time Pyribenzamine is available in the form

of a 2 per cent ointment or cream. Our results with the water washable cream have been more favorable than with the anhydrous preparation. Some claim has been made for the use of such a cream in the prevention of sunburn. The effect of Pyribenzamine in such cases is more likely due to the screening out of the ultraviolet rays similar to that obtained from so-called suntan lotions, rather than to any specific pharmacologic action. This is suggested by the fact that other antihistaminics such as Benadryl do not have this property, and the anti-sunburn effect may be obtained when Pyribenzamine is applied to a quartz plate overlying the skin.

While most antihistaminics are too irritating for topical application to mucous membranes, some have been prepared in buffered solutions for use in the eye, nose, and for bronchial nebulization. Our own experience with eye medication thus far has been limited to a 0.5 per cent solution of Antistine.[17] A few drops of this solution will afford temporary relief in some cases of allergic conjunctivitis. The effect of the same solution in the nose is not striking, but in combination with Privine HCl 0.025 per cent, the decongestant action on the nasal mucosa appears to be more intense and prolonged than from either drug alone. Such combinations are receiving further study. A 2 per cent buffered solution of Pyribenzamine has sometimes been found helpful in relieving an asthmatic paroxysm when administered by nebulization, but the majority of asthmatics fail to obtain any appreciable benefit.

Untoward side effects from antihistamine drugs have limited their use in many instances. These appear to be less frequent with some of the newer drugs. Drowsiness is the most frequent untoward action, while vertigo, headache, fatigue, nervousness and gastro-intestinal irritation are also very common. In addition, many bizarre effects difficult to reconcile with the known pharmacologic actions of the drug have been encountered. The toxic effects in animals are almost totally different from those occurring in humans, and it has not been possible to predict from toxicity studies in animals, the type or probable extent of untoward action in man. At times the sedative effect of these drugs is a desirable feature. It is sometimes advisable to prescribe a well tolerated antihistaminic for use during the day, and one with a higher incidence of sedative action at bedtime. Sedation is also helpful in urticarial and other pruritic eruptions. As yet there have been relatively few reports of serious toxic effects from the use of these compounds. With increasingly wider use, the possibility that some may occur should be kept in mind, and frequent examinations of the blood and urine should be carried out in those receiving the drugs continuously for long periods of time.

It is quite possible that the full potentialities of therapy with antihistamine drugs have not been fully realized. Further study may show that some of the effects produced by these agents are not necessarily related to histamine antagonism, and they may be found helpful in situations where histamine release is not a factor. At the present time their usefulness in allergic states is generally acknowledged, but it is well to keep in mind the limitations as well as the indications for their use. They are purely symptomatic agents, and do not produce a cure. While they are more helpful in relieving certain allergic symptoms, they are often less effective than older symptomatic drugs in the relief of others. Their use by no means eliminates the need for an immunologic study of each case of allergy, since it is only by careful attention to the etiologic factors involved that permanent or long standing relief is possible. As an adjunct to specific therapy, the anti-histamine drugs represent a valuable addition to the list of effective anti-allergic measures.

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DISCUSSION OF DR. FRIEDLAENDER'S PAPER

Donald Cowan, M.D.
University of Minnesota

Dr. Friedlaender has given us a very concise picture of the present status of this new group of drugs. It is apparent that the list of different antihistaminics available is quite long already, and more of them will be placed on the market from time to time, as the very active search for newer and better ones continues.

Dr. Friedlaender has pointed out some of the limitations of their use. Among these are: First, they are not equally effective in all persons with a given allergic condition. Second, they are not equally effective in all types of allergic disease. Thus asthma is not nearly as well controlled by the antihistaminics as are the eye symptoms and rhinorrhea of hay fever, for example. Third, side-effects occur which may limit their usefulness in some persons. These side effects are unpredictable except that some of the drugs are more prone to produce them than others. Certainly there is no correlation between side effect and symptomatic relief obtained.

Like many others who are interested in allergy, we have experimented with the various antihistaminic drugs. On the basis of controlled experiments conducted last year with hay fever patients, both with and without asthma, we have satisfied ourselves on two points:

1. By trying out a number of different antihistaminics on the same patient, a drug can almost always be found which will prove effective in the control of hay fever symptoms without troublesome side effects, for that particular patient. In our group there were only 7 per cent failures—that is, only 7 per cent of the patients had poor or no relief. And, again for the group, while taking their individual "best" drugs, the incidence of side effects amounted to only 6.6 per cent.

Thus we agree with Dr. Friedlaender, that one will have better results by trying several antihistaminic drugs on the same patient, if need be, to find the best one for him.

2. Contrary to Dr. Friedlaender's impression, we believe that an antihistaminic plus an antispasmodic yields good results in the control of asthma. We have used three types of such medication:

(1) An antihistaminic (it matters little which one) plus an antibarium (the strongest of which are Trasentin, Pavatrine, Amethone and 1721 Searle),

(2) An antihistaminic plus aminophylline (such as Hydrallin),

(3) Drugs which are strongly antihistaminic and antispasmodic in the same molecule (for example, the chlorotheophylline salts of 1721 Searle and 1627 Searle),

and we are now interested in trying a fourth combination—an antihistaminic plus a sympathetic stimulant.

With these combinations, and again changing from one to another in the same patient, until the best one for him is found, we have had failure (that is, poor or no relief) in only 21 per cent of pollen asthmas, and 50 per cent had excellent (that is, 75 to 100 per cent) relief.

Unfortunately, the side effects with these combinations were much more frequent than with the antihistaminics alone. Side effects occurred in 30 per cent of the patients while they were taking their best drugs. Furthermore, the reactions were so severe for some of the drugs (specifically, 1721, 1695, and 1913 Searle), that it is doubtful whether they should be introduced into routine therapy for that reason.

It seems to me that as time goes on and newer and better antihistaminics and combinations become available, there is real hope for good symptomatic relief for most of the allergic states in a very large percentage of people who have them. It is to be remembered, of course, that, as Dr. Friedlaender has pointed out, the availability of these drugs allows only for better symptomatic treatment and does not lessen the need for etiological diagnosis and more specific therapy of the allergic condition at fault.

NORTH DAKOTA SYMPOSIUM ON CHEST DISEASES

The Grand Forks District Medical Society will conduct a symposium on chest diseases on Saturday, June 30, beginning at 1 o'clock in the Hotel Dacotah, Grand Forks, North Dakota. The symposium will last all afternoon.

Those who will address the society will be Dr. William L. Wallbank of San Haven, North Dakota, on "Some Aspects of Pulmonary Tuberculosis"; Dr. Herbert Schmidt, Mayo Clinic, Rochester, Minnesota, on "Medical Bronchoscopy"; Dr. Chauncey N. Borman, Minneapolis, Minnesota, on "Roentgen Diagnosis, Nontuberculous Pulmonary Conditions"; and Dr. Thomas J. Kinsella, Minneapolis, Minnesota, on "Surgical Aspects of Pulmonary Disease." Discussion of papers will take place in the form of a round table discussion with questions and answers.

There will be a banquet in the evening for all the attending physicians and their wives. The Grand Forks District Medical Society extends an inivtation to all physicians and their wives who are interested in attending. Those who wish to attend the dinner should write in for reservations.

The JOURNAL LANCET

Official Journal of the American College Health Association, Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology

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Editorial

HYPERSENSITIVITY IN MAN

Despite unceasing investigations at the bedside and in the laboratory for more than forty years, the diseases of allergy remain an enigma of medical science.

The hypersensitive states as seen in general practice include allergic rhinitis of the perennial and seasonal hay-fever type, asthma, urticaria, angio-edema with cutaneous, cerebral and visceral manifestations, allergic dermatitis and allied dermatoses, serum disease, serum shock, the Arthus type of hypersensitivity, and, probably, drug idiosyncrasies. In addition to these manifestations of hypersensitivity a variety of other human illnesses, such as rheumatic fever, acute glomerular nephritis, and the acute inflammatory reactions that occur following serum and drug therapy, are commonly accepted as having an allergic component. The protean manifestations of the hypersensitive state in man, moreover, have led physicians and patient alike to accept as possible evidence of hypersensitivity isolated signs or symptoms that occur during the course of a wide variety of other illnesses.

The appreciation that these variegated manifestations are secondary to an antigen-antibody reaction has occurred slowly over a period of more than a half a century. Soon after the discovery of diphtheria toxin it was recognized that serum disease and serum shock in man and anaphylactic shock in animals resulted as the response of the host to secondary contact with the same antigen, usually a foreign protein. Such exaggerated responses on contact with the specific antigen led to conflicting theories in explanation of what took place. When it was learned that not all antigen-antibody reactions gave rise to exaggerated responses, efforts were made to explain what took place. The importance of hereditary influence was early recognized for the atopic types. The studies by Dale and his associates led to the conclusion that a histamine-like substance is responsible for the immediate symptoms. Prevention has been stressed. This is accomplished through avoidance of the specific allergen, or by employing it in minute doses parenterally for desensitization. More recently a variety of newer preparations have been added to epinephrine and ephedrine for relief in hypersensitive states of the physiological effects of the histamine-like response to antigen-antibody combinations. These preparations have opened up new avenues for investigation and for the relief of the discomforts of the hypersensitive state.

It is through such authoritative presentations as have been reproduced in the JOURNAL-LANCET in this issue and many preceding issues that newly established and accepted facts in allergy are made known to the physicians that can apply them in their daily practice.

North Dakota State Medical Association

Report of the Grand Forks Diabetes Detection Drive

E. A. Haunz, M.D.,* and T. Q. Benson, M.D.†

The first "Diabetes Week" in history, sponsored by the American Diabetes Association, December 6-12, 1948, has proven both justifiable and successful in its objective on the basis of preliminary reports. The favorable response by both the public and physicians has been unanimous wherever doctors' committees and diabetes associations have carried out an intensive program. Material for nearly 500,000 urinalyses was distributed free of charge through the office of the secretary of the American Diabetes Association. Preliminary reports on 113,000 tests indicate that in adults, about 1 per cent new cases may be anticipated.

October 10-16, inclusive, has been designated "Diabetes Week" for 1949. Dr. Howard F. Root, chairman of the National Committee on Diabetes Detection, has announced the following objectives for "Diabetes Week" in 1949: (a) that county medical societies form diabetes committees, preferably to consist of general practitioners, rather than specialists in this disease; (b) that postgraduate instruction in diabetes be sponsored by county societies and hospital staffs; (c) that talks be given on diabetes in civic clubs, women's clubs, industrial groups, etc., again by general practitioners, rather than specialists; (d) that films prepared by the U. S. Public Health Service will be available upon request from Dr. Hugh L. C. Wilkerson, Diabetes Section, U. S. Public Health Service, 695 Huntington Avenue, Boston 15, Massachusetts; (e) that free urinalyses and blood sugar tests be offered all editors, reporters and employees of newspapers as an introductory gesture.

Earlier detection of diabetes can be achieved without public expense if each physician will agree to urge diabetic patients to perform urinalyses on their relatives. If any of these prove suspicious, the family doctor will carry out further investigation.

There is considerable latitude in the process of organizing and operating local diabetes detection drives. The Grand Forks community diabetes detection drive of December 6-12, 1948, is briefly reported below to exemplify merely one of the many plans which have succeeded throughout the country.

According to Dr. Root, the total of 1,810 tests performed in Grand Forks was "a far better report than has been submitted by most communities of comparable size." At its November, 1948, meeting the Grand Forks District Medical Society voted unanimously to support a local diabetes detection drive. The society president appointed a chairman and four committee members, the latter to serve as a board of censors for all types of publicity. Three detection centers were set up in the two local hospitals and in the dispensary at the University of North Dakota, each supervised by a separate committee. An appropriation of $100 was voted by the District Medical Society to defray expenses of the drive. In addition to the above participants, 28 physicians of the society cooperated generously in giving public addresses on the two radio stations during the period from November 28 to December 5, inclusive. Radio publicity was well-counterbalanced by the full cooperation of the Grand Forks Herald.

The ultimate success of the drive was attributed chiefly to the extensive radio and newspaper publicity which far exceeded the expectations of the committee. The campaign was launched with the publication of a group picture of the committee's inaugural luncheon, together with spot radio announcements. This was followed by daily news articles on the subject of diabetes, including a front-page editorial. The daily radio addresses were prepared by individual physicians themselves, but always subject to approval by the board of censors before being broadcast. The keynote of all publicity was consistently that of optimism, and alarming words, such as coma and death, were generally avoided. The excellent prospects for normal longevity in the well-controlled diabetic was the dominant theme. Detection centers were open from 2 to 6 and 7 to 9 P.M. daily, and it was emphasized that everyone report within one hour after a full meal. Each individual reporting to a detection center was given a slip of paper with the following statement: "If the results of your test indicate that you *may* have diabetes, you will be notified promptly by mail. If the results of your tests are entirely normal, you will hear no further." Individuals with positive tests were sent the following letter:

Name .....
Address .....

Dear Mrs. Smith:

The results of your recent diabetes test indicate that you *may* have diabetes. This means that you should report to your physician as soon as convenient for further tests to determine whether or not you are actually diabetic. This is *your* responsibility. Do not delay. Remember, if you have diabetes, there is no cause for alarm. Proper treatment will insure a normal life span for you. Please notify us immediately what doctor you are selecting to investigate your case.

Very truly yours,
Committee on Diabetes Detection
By:
Grand Forks Deaconess Hospital
or St. Michael's Hospital

P. S.: Use the enclosed postal card for your reply.

Read at the 62nd annual meeting, North Dakota State Medical Association, May 16, 1949.

*Chairman of North Dakota Organizing Committee.

†Chairman of Grand Forks Diabetes Detection Drive.

Of the total of 1,810 tests performed, each of which consisted of a Clinitest and Galatest, 27 specimens showed one plus or more glycosuria and 24 additional tests showed a trace of sugar. Of this a total of 16 cases of diabetes mellitus were later proven to exist, or an incidence of approximately .88 per cent, which is only slightly less than the preliminary incidence reported on a nation-wide basis. The lower incidence is probably best explained by the fact that 500 tests were performed on University students, in whose age group the incidence of diabetes is known to be considerably lower than those in the third, fourth and fifth decades of life. Undoubtedly the incidence would also have been higher if the Wilkerson-Heftmann blood sugar screening tests could have been incorporated in the detection program. It is anticipated that this new screening test will be included in the 1949 detection program. The Grand Forks diabetes detection drive was a "pilot test" to evaluate the feasibility of conducting a program on a state-wide basis in North Dakota during "Diabetes Week" in 1949. We are definitely of the opinion that a more inclusive program will prove invaluable to the health of the nation. Indeed, such a program enjoins much greater therapeutic promise for the undiscovered diabetic than present-day science can extend in such fields as heart disease, cancer, poliomyelitis, multiple sclerosis, etc., for which untold millions are volunteered by the public annually. Coupled with this fact, "Diabetes Week" is unique in that it is not the usual drive for funds, but instead a gratuitous service to the public-at-large.

Despite the repeated announcement that known diabetics should not report, three known cases reported for the detection tests in the Grand Forks drive. These are, of course, not included in the totals.

The success of "Diabetes Week," both nationally and locally in 1948, should serve as a stimulus for a much greater response to the 1949 detection drive. Certainly the end justifies the means. Perhaps a good slogan for the next diabetes detection drive would be Sir William Osler's famous remark, "The way to live a long life is to contract a chronic disease and take care of it," altered to read, "One way to live a long life is to have diabetes and take care of it."

Meet Our Contributors

A. V. Stoesser, M.D., Minneapolis, was graduated from the University of Minnesota in 1925, specializes in Pediatrics and Allergy; member, American College of Allergists, American Association of Immunologists; Associate Professor of Pediatrics, University of Minnesota.

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Jacob S. Blumenthal, M.D., Minneapolis, was graduated from the University of Minnesota in 1924; specializes in Internal Medicine and Allergy; Assistant Clinical Professor, University of Minnesota; President, St. Andrews Hospital; member, American College of Physicians, Trudeau Society, Minnesota Pathological Society, Minneapolis Society of Internal Medicine, Alpha Omega Alpha.

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T. Q. Benson, M.D., Grand Forks, North Dakota, was graduated from the University of Minnesota in 1930; specializes in Internal Medicine; member, Grand Forks District Medical Society.

Book Reviews

Fundamentals of Pulmonary Tuberculosis and Its Complications. Edited by Edward W. Hayes. Sponsored by the American College of Chest Physicians. Pp. 470, with 182 illustrations. 1949. Springfield, Illinois: Charles C Thomas. $9.50.

This authoritative and widely useful book will serve other purposes besides pointing the way to the control and eventual eradication of tuberculosis—the foremost reason for its preparation. The point is effectively emphasized to practitioners and medical students that knowledge of the natural history, diagnosis and treatment of tuberculosis is fundamental in all phases of medical practice; the possibility of its presence enters into every differential diagnosis; where present there must be modification of treatment in a variety of other diseases.

The panel of co-authors, under a distinguished editor and editorial committee, has supplied outstanding individual contributions, illustrations and bibliographies. Every medical student should own and study this book. Every practitioner and medical teacher should be thoroughly familiar with its contents.

M.M.W.

Clinical Allergy, by Alexander Sterling, M.D. New York: International Universities Press, 198 pages, 1947, $5.00.

This is a monograph on the management and treatment of allergic diseases. It is based on the results of the clinical research and practical experience in the field of allergy obtained by the author at various clinics. There are 16 chapters, each one of which discusses in a practical way the necessary steps in properly diagnosing and successfully taking care of an allergic patient. Throughout the book the author has tried to be thorough but at the same time brief and clear in his presentation of the subject matter. There are no long discussions. The monograph is highly recommended for general practitioners and students of allergy.

A.V.S.

Management of Common Gastro-Intestinal Diseases, by Thomas A. Johnson. 1948. Philadelphia: J. B. Lippincott Company. $7.00.

The several sections of this compendium are not of uniform value or quality. The first four chapters offer well established advice which may safely be accepted by anyone with less experience in these matters than the authors. Schindler and Blomquist on chronic gastritis, Kirsner and Palmer on gastric carcinoma, and Sara Jordan on benign gastric ulcer all present their subjects aptly and succinctly. Andresen's discussion of bleeding peptic ulcer is exceptionally sensible. His recommendations are based on physiologic principles and include administration of whole blood by numerous small transfusions or continuous slow drip infusions, and early feeding of milk and gelatin mixtures.

Chapters 5 and 6, concerned with enterogastrone and protein hydrolysate respectively are probably of evanescent interest.

Chapter 7 deals with psychosomatic aspects of gastro-intestinal disorders with emphasis properly placed upon positive and not negative, exclusive diagnosis. The assumption that peptic ulcer and ulcerative colitis are purely psychosomatic diseases is unwarranted. The typical psychiatric mannerism of submitting reports of single cases with broad generalizations therefrom as proof of etiologic and therapeutic claims is glaringly illustrated. Psychiatrists must soon conform to the rigid standard statistical judgment of results demanded of other therapists. After thorough consideration by Crohn and Yarnis of regional enteritis, the identity of this disease is still obscure. The primary cause of the granulomatous, infiltrative invasion of segments of the small and large intestines may be multiple.

Chapters 10 and 11 on the pancreas summarize present knowledge of the diseases of this enigmatic organ, but yield very little definitive diagnostic information.

Cirrhosis of the liver is presented in orthodox manner with perhaps insufficient stress on early, presumptive diagnosis, before appearance of ascites, jaundice and bleeding from collateral and congestive vascular sources. In chapter 12 the relation of chronic infectious mononucleosis to infectious hepatitis, with respect of glandular, pulmonary, pleural and nervous system manifestations of each is recognized, and the distinction between infectious and homologous serum hepatitis is well made; but the importance of hepatitis in establishment of persistent, chronic liver damage is not clearly stated.

Idiopathic ulcerative colitis and segmental enterocolitis are not sharply distinguished in chapter 13, and discussion of time and circumstances for medical and surgical treatment of particular forms of colitis is meager. The attitude toward psychotherapy of colitis is properly conservative. Elucidation of irritable colon is sane and sound.

Essential facts about cancer of the colon are given in chapter 15, although the arrangement of the material is somewhat disorderly. Bercovitz authoritatively expounds the diagnosis and treatment of amebiasis.

J.B.C.

The Child in Health and Disease, by Clifford G. Grulee, M.D., and R. Cannon Eley, M.D., 1066 pp., illustrated. 1948. Baltimore: The Williams & Wilkins Company. $12.00.

Periodically comprehensive textbooks of pediatrics have been offered to the practitioner and student of medicine. This book is a new one which has been under preparation for some time. This fact alone is revealed in the subject matter of the large number of contributors. All of the material is up to date. The 91 chapters of the book are divided into 19 sections making it rather easy to locate material for study. The diseases of infancy and childhood are discussed under the headings of history and incidence, etiology, pathology, symptoms and diagnosis, complications and sequelae, treatment and prognosis. Research and investigation is only referred to by the various authors when it is necessary to emphasize something on the practical side of pediatrics. Of course it is difficult to keep a textbook of this size in step with the rapid advancements in the field of medicine, but nevertheless this book is recommended as a reference and textbook for all who are interested in the health and care of infants and children.

A.V.S.

A.M.A. Interns' Manual. 209 pages. 1948. Philadelphia & London: W. B. Saunders Co. $2.25.

This pocket-size volume was planned, written and published explicit from the title, for use by hospital interns. Consequently, the opinion of an active, studious and conscientious intern was solicited with respect to the obvious purpose of the book. His comments and criticism, with which the reviewer from many years of practical teaching experience is inclined to agree, are presented.

Section I, describing and explaining desirable, essential and required characteristics of internship and residency, is unnecessary. Presumptively the buyer and reader of this manual is established in a hospital, and should or could have acquired the knowledge offered in this section from current sources—issues of the *Journal* of the A.M.A.

Section II expounds clinical and laboratory data which, in many particulars, are incomplete or obsolete. Procedures advised for ordinary contingencies are often inadequate, notably those for gastro-intestinal bleeding. And, hospitals which quality for internships have well-seasoned directions for management of all medical and surgical conditions. More complete and pertinent information about drugs and therapy may be found in other handbooks, specifically Cutting's *Manual of Clinical Therapeutics,* also published by Saunders, or the *Physician's Handbook.* Cutting's *Manual* is slightly more expensive than the A.M.A. *Manual,* but it is pocket size and more complete and is generally preferred by interns.

The pragmatic attitude of an intern is expressed in an observation about Section V which is concerned with poisons. The suggestions of antidotes to be used would be valuable if the poison in a particular instance were known, but usually the cause of the obviously critical physical condition of a suddenly confronted patient is obscure. A description of definitive signs and symptoms for specific toxic agents if possible would be helpful.

J.B.C.

American College Health Association News

The American College Health Association is happy to announce the Executive Committee's acceptance of the following colleges into its membership:

Xavier University, Mr. Warren P. McKenna, Director of Health Service, New Orleans, Louisiana.

National College of Education, Dr. Josephine Earlywine, Director of Health Service, Evanston, Illinois.

The final election for membership will be taken at the Association's annual meeting in December, 1949.

The Council of the American College Health Association has voted an increase in Association dues from $10.00 to $15.00 a year beginning January 1, 1950.

The South Central Section of the A.C.H.A. held its annual meeting on April 9 in Pittsburgh, Kansas. The following officers were elected for the coming year:

President, S. I. Fuenning, M.D., Director of Student Health Service, University of Nebraska, Omaha.

Vice President, William E. Taylor, M.D., Director of Student Health Service, Southwest Missouri State College, Springfield.

Secretary-Treasurer, J. Ralph Wells, M.D., Director of Student Health Service, Kansas State Teachers College, Pittsburgh.

Word has just been received that Dr. John G. Frisch is now Director of the Medical Department, Wisconsin State Teachers College, Milwaukee. He replaces Dr. Elsa Edelman, former director.

The University of Colorado Student Health Service is in need of an assistant director experienced in student health work. Write: L. W. Holden, M.D., Director of Health Service, University of Colorado, Boulder, Colorado.

Smith College, Northampton, Massachusetts, is in need of one, perhaps two, women physicians for the college year, 1949-50, beginning in mid-September, to practice general medicine. Write: Dr. Edith C. Stackpole, Director of Clinic, Smith College, Northampton, Massachusetts.

Duke University Women's College desires a woman physician for its Student Health Service. Write: Dean R. Florence Brinkley, Duke University Women's College, Durham, North Carolina.

Knox College, Galesburg, Illinois, is interested in finding a physician for the Student Health Service. Write: President K. D. McClelland.

On April 22nd and 23rd, 1949, the second meeting since the war, or the Eleventh Annual Meeting of the North Central Section of the American College Health Association, was held at Winona, Minnesota, under the

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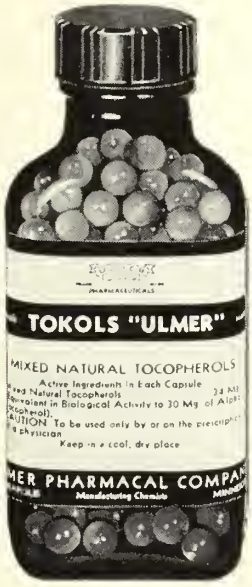
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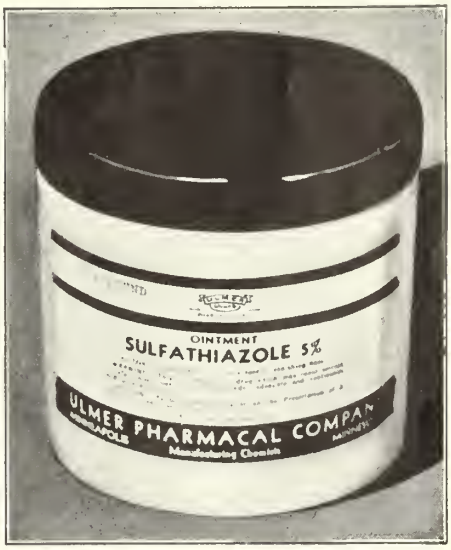
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sponsorship, jointly, of St. Mary's College and The Winona State Teachers College. There were forty-three representatives of eighteen colleges and two city health departments in attendance. The program was interesting and it was demonstrated, I think, that this is a worthwhile activity and is of considerable service toward promoting the broad purposes of student health throughout this section. Officers for the year 1949-1950 elected at this session are as follows: President, John W. Brown, M.D., University of Wisconsin, Madison, Wisconsin; President-elect, J. W. Hanson, M.D., Carleton College, Northfield, Minnesota; Vice-President, Gail A. McClure, M.D., Iowa State College, Ames, Iowa; Secretary-Treasurer, Ray R. Ruckert, M.D., University of Wisconsin, Madison, Wisconsin. Elected to Executive Committee, Donald H. Peterson, M.D., St. Olaf College, Northfield, Minnesota.

The next annual meeting of this organization will be held at the University of Wisconsin, Madison, during or about the third week in April, 1950. The attempt will be made to stimulate the participation of all colleges of whatever size throughout the North Central Section to become active participants in their sectional organization of the American College Health Association. The section includes the states of Iowa, Wisconsin, Minnesota, North Dakota, and South Dakota.

If any of the local sections have any meetings, change of officers, or any other items of interest to member institutions or others concerned with college health work, please forward the information to the American College Health Association, Dr. Edith M. Lindsay, Secretary-Treasurer, School of Public Health, University of California, Berkeley 4, California.

Classified Advertisements

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Advertisers' Announcements

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A 40 per cent reduction on Parenamine 6 Per Cent, the "life-saving protein hydrolysate for parenteral injection, is announced by Joseph G. Noh, vice-president, Winthrop-Stearns Inc.

The new price for a 1,000-liter administrative flask is $2.25, as compared with the former price of $3.75. The reduction, according to Mr. Noh, was made possible by increased production resulting from heavy demand for the new formula announced last February.

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Wyeth-Nepera Allergy Film Fascinates Doctors

A color and sound moving picture summarizing the most advanced medical views on allergy proved a big attraction at the annual convention of the American College of Physicians in New York April 1. With every seat and square foot of standing room occupied and spectators overflowing into the aisles, the back and sides of the room, the continued rapt attention of the physician audience for three-quarters of an hour was the best proof that the "Allergy" film, jointly sponsored by Wyeth Incorporated of Philadelphia and Nepera Chemical Company of Yonkers, N. Y., was a resounding success. The film was produced under the direction of Dr. Leo H. Criep, Associate Professor of Medicine of the University of Pittsburgh School of Medicine. It dramatizes the latest biochemical theories of anaphylaxis, the antigen-antibody reaction, the formation of circulating, fixed and blocking antibodies, and the action of histamine antagonists in preventing the release of histamine in hypersensitized animals and man.

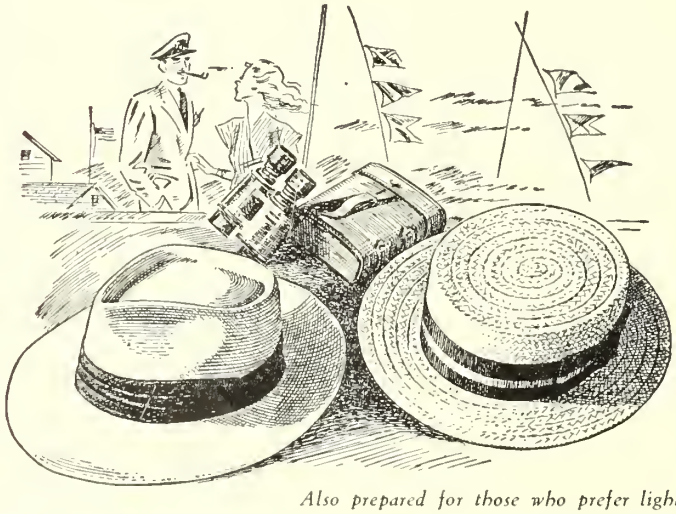
The greatest part of the film concerned itself with a detailed discussion of human allergy, dividing it into those cases which resemble anaphylaxis in animals (and which respond remarkably to Neohetramine, which has the least and mildest side reactions of the effective drugs of its character) and those which are of the delayed reaction of tuberculin type, which are uninfluenced by anti-histamine drugs. Numerous clinical examples were shown, representing every type of allergic disturbance, including atopic dermatitis, contact allergy, asthma, allergic rhinitis, serum reaction, hives, and angioneurotic edema.

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The JOURNAL LANCET

Minneapolis, Minnesota
July, 1949

Vol. LXIX, No. 7
New Series

Primary Epithelioma of the Ureter*

Baxter A. Smith, M.D.
Minneapolis, Minnesota

In the past, tumors arising in the ureter have been considered rare and of very poor prognosis. This report is intended to lend support to a conviction to the contrary.

Several extensive reviews of the literature have been made in the last fifteen years. Scott has an extensive bibliography. It is interesting to note that two-thirds of the reported cases have appeared in the last decade. Higgens reported five cases in 1938, bringing the total to ninety-one at that time. Probably about 250 cases are now reported. The lesion was first described in 1841. Foord and Ferrier reported that only eight cases had been reported before 1900. The first case in which the correct diagnosis was made preoperatively was reported in 1902. Colston reported two cases in 22,000 urological admissions at Johns Hopkins to 1933. Bell (quoted by Stang and Hertzog) found one case in 37,000 autopsies at the University of Minnesota.

There were eighteen cases seen at the Mayo Clinic in nineteen years as reported by Cook and Counseller in 1941. In 1944 they added nine new cases. At the University of Minnesota Hospitals and in private practice eight cases were diagnosed between January 1946 and January 1948. One case had previously been seen in the University of Minnesota Hospitals in 1941; while no new cases of primary ureteral tumor have been seen in 1948 to date, it would seen that the condition should not be considered rare. Thomas and Regnier stated that 5 to 7 per cent of all renal tumors were tumors of the pelvis and ureter, and of these about 15 per cent were of the ureter alone. In the last three years, primary ureteral neoplasms have been as common as tumors of the renal pelvis in our experience.

Etiology is unknown except for the relationship to aniline dye exposure. Associated stone in the ureter has been seen, usually in infiltrating squamous or transitional carcinoma. In similar lesions of the renal pelvis, stone is present in 50 per cent of the cases. Most cases appear in the sixth decade; the youngest reported was 22 years of age. Most of the reported cases have been in males; one-half occur in the lower one-third of the ureter, and the right ureter is involved about twice as often as the left (Scott).

Pathologically the epithelial tumors of the ureter closely resemble similar lesions of the bladder or renal pelvis. They may be papilloma (papillary carcinoma Grade I), papillary carcinoma, or squamous or transitional carcinoma. Scott states 50 per cent were papillary. Mesenchymal tumors of the ureteral wall have been described but are quite uncommon. Metastatic tumor of the ureter (excluding carcinoma of the cervix) has been considered uncommon, but eleven cases have been encountered by us; the primary manifestation of the neoplasm has been its ureteral involvement in three instances. It has been accepted generally that the prognosis has been poor because extension through the rela-

*Inaugural thesis: read before the Minneapolis Academy of Medicine meeting, November 15, 1948.

tively thin ureter occurred earlier than through the relatively thick bladder. Metastases from primary ureteral neoplasms involve mainly the regional lymph nodes, then distant lymph nodes and liver, adjacent bones, lung, kidney, and adrenals in that order of frequency, but most organs have been reported as the site of metastases.

Symptoms are hematuria 70 per cent; pain (renal colic, renal ache, metastatic pain) 60 per cent; and mass in 40 per cent. The mass is usually the hydronephrotic kidney. The tumor may be palpated vaginally at times, and extension and metastatic lesions may be palpable if large. Symptoms of vesical irritation or secondary infection may be present, and evidence of extensive carcinoma may predominate. *Hematuria following nephrectomy, if seen to come from the ipsolateral ureter, is diagnostic of ureteral neoplasm.*

Urinary findings vary. Usually hematuria is present in some degree and evidence of infection may be present. Cytologic study may show neoplastic cells, and should be an adjunct in differentiating non-opaque calculus from tumor, particularly when complete obstruction of the ureter to the retrograde injection of dye with impacted bulb or Garceau catheter is present. KUB film shows an enlarged renal shadow if hydronephrosis is present, and excretory urogram usually shows no function or hydronephrosis and hydroureter, sometimes demonstrating the filling defect.

Cystoscopic procedures usually make the diagnosis possible. Vest states that the tumor protrudes from the ureteral orifice in 30 to 35 per cent of the cases. This occurred in only one of our cases. At times the tumor may be visible only during ureteral peristalsis. Secondary "implants" may be present in the bladder. There may be bulging or edema of the intramural ureter. Renal function of the involved side usually is impaired or absent. Bleeding from the ureteral orifice may be seen, and if it occurs in a steady trickle rather than associated with spurts of urine, it is particularly significant of lower ureteral disease. Upon attempting the passage of ureteral catheters, impassable obstruction is frequently encountered. This usually doesn't feel like stone in the lower ureter, but above 5 centimeters one can attach no significance to the "feel". Associated with prodding of the catheter, rather profuse bleeding may occur. If the urethral efflux is bloody, the renal urine obtained by catheter may be clear or less bloody, and if the renal urine is not more bloody than the bladder urine, the fact is significant.

Retrograde pyeloureterograms are most important in the diagnosis. Filling of the ureter may be best obtained by impacting an acorn bulb, a Braasch bulb, or a Garceau catheter in the lower ureter after ascertaining all air bubbles have been evacuated, and then injecting dye, colored with indigo carmine, under cystoscopic vision. A pyeloureterogram may be obtained showing hydronephrosis and hydroureter above a characteristic filling defect of papillary tumor. Complete or almost complete obstruction to the injection of dye may be seen, and often even then, filling defect can be observed. In infiltrating carcinoma the lumen may be irregularly narrowed over considerable distance.

Ureterogram is of the utmost importance in any investigation of the upper urinary tract for bleeding because coincidental renal disease is not uncommon. One of the patients here reported had hydronephrosis due to incomplete rotation and ureteropelvic junction obstruction in addition to hydroureter below, secondary to obstruction of ureteral tumor. Another had nephrectomy for renal tumor which proved to be cyst. Another had nephrectomy for calculous pyonephrosis. *Ureteral tumor, primary or metastatic, must be considered when hydroureter is seen at the time of renal surgery unless the hydroureter has been adequately explained.*

In differential diagnosis one must consider any lesion giving obstruction and filling defect. Blood clot, fibrin, non-opaque calculus, tumor metastatic to the ureter, endometriosis, inflammatory infiltrations from within or without, and foreign body are most likely to confuse. Ureteral tumor is commonly secondary to epithelial tumors of the renal pelvis, of course, and tumor of the renal pelvis must be excluded before ureteral tumor may be called primary. Squamous and transitional carcinoma are occasionally associated with ureteral stone, and exploration may be necessary to establish the presence or absence of neoplasm in the case of a long-impacted calculus with much ureteritis. In the presence of bleeding, repeated films may be necessary to exclude clot.

Treatment advised is complete nephroureterectomy to include a cuff of bladder containing the intramural ureter. Most observers feel quite strongly that ureteral tumors, despite a microscopically benign appearance, should not be treated conservatively unless the preservation of renal function is essential. Conservative measures to be considered in such an instance would be resection of the tumor-bearing ureter with anastomosis or transplant to bladder, renal pelvis, bowel, or skin, or nephrostomy.

Nephroureterectomy may be done in two stages if the patient's condition indicates it. If a two-stage procedure is decided upon, the tumor-bearing ureter should be removed in the first stage, making a cutaneous ureterostomy if the tumor is in the lower ureter. Foord and Ferrier reported the mortality in forty-four reported one-stage nephroureterectomies to be 40 per cent, and in twenty-two two-stage nephroureterectomies to be 5 per cent.

At the present time, the operative mortality of one-stage nephroureterectomy should not be appreciable in any standard risk patient. A one-stage procedure should be done by choice, preferably beginning with the lower ureter, coiling the vesical end high in the wound, and removing the specimen intact with the kidney, thereby opening the urinary tract only once, and decreasing the chance of implantation. The change from supine position to the "kidney position" affects blood pressure more adversely than the reverse procedure, however. Macalpine does not advocate removal of the bladder cuff because of danger of "seeding" of tumor, but most sur-

geons believe the danger of subsequent tumor involvement of the intramural ureter makes excision of the intramural ureter mandatory.

Colston suggested fulguration of the intramural ureter to destroy its epithelium, but no longer advocates it. Radiation therapy is of little value.

Treatment continues for at least five years in the form of periodic cystoscopies relative to vesical recurrence. Appropriate therapy is instituted if there is vesical recurrence. Eleven of the twenty-seven cases reported by Counseller and Cook had bladder recurrences.

Prognosis depends upon the degree of malignancy of the lesion, and the extent of its growth at the time of therapy. O'Conner states that papillary tumors of the upper urinary tract are the only tumors of the upper urinary tract where the prognosis is appreciably improved by early diagnosis and treatment. Foord and Ferrier reported six cases, all with metastases, and Higgens reported five cases; four died within a year, and the other was terminal within a few months. Counseller and Cook found ten of eighteen cases to be Grade I and II carcinomas, eight to be III and IV. Of the ten followed cases in Grade I and II, seven were alive four years or more, and one thirteen years after surgery. Of the patients with Grade III and IV tumors, one died postoperatively. Six died in less than two and one-half years, and one was living twelve years after surgery, but was believed to have vesical recurrence at time of writing. Only one of our cases had squamous carcinoma; he was most recently operated upon, and is the only patient now dead. Vest reported three cases in which conservative surgery was employed. One was well without recurrence seven and one-half years; one two and one-half years, and one fifteen months after surgery. He stated he wrote to many authors and none reported metastases in "benign" ureteral tumors.

Of the papillary tumors we have seen,[8] one (M.B.) has known recurrence, that at the site of the excision of intramural ureter. She also has two skin carcinomas (buttock), and a transitional cell carcinoma of the parotid (metastatic or primary?); for many years she ingested arsenic as a tonic. Her symptoms were of about six months duration, but seven years before she had had identical symptoms for a period of time. Two-stage procedure was employed; there was extensive papillary carcinomatosis of almost the entire ureter including the intramural ureter. Recurrence appeared one year later, intra- and extravesical, at the site of the excision of intramural ureter. Repeated transurethral resections, and the implantation of radon have kept the lesion under control to the present time.

The patient (M.S.) with squamous carcinoma was seen twenty-one months before he allowed investigation beyond an excretory urogram. When first seen, an excretory urogram showed left hydronephrosis filling only a few calices. When next seen, seventeen months later, an excretory urogram showed no renal function on the left, and a vesical filling defect at the site of the left ureter was seen. Diagnosis of probable primary ureteral tumor was made, but further investigation was refused until bleeding interfered with voiding. At cystoscopy a tumor the size of a golf ball presented from the ureter, and involved the vesical mucosa for a centimeter radius from the dilated ureteral meatus. At ureterectomy a large segmental resection of the bladder was done, but there was extensive fixation of the lower ureter to adja-

Patient	Sex	Age	Pain	Mass	Hematuria	Level in Ureter	Side	Duration Symptoms to Definitive Surgery	One Stage Nephro-ureterectomy	Two Stage, Elect.	Two Stage, (bleeding ureteral stump)	Pathology	Follow-up
D. M.	F	57	X	0	X	L	L	4 mo.	X[3]			Papilloma	Neg. 7 yrs.
E. B.	F	71	X	0	X	M	L	3 mo.	X			Pap. ca.	Neg. 2 yrs.
H. H.	F	74	0	X	X	L	L	1 mo.			X[4]	Multiple pap. ca.	Neg. 2 yrs.
T. O.	M	65	0	0	X	L	R	19 mo.			X[5] EAW	Two papillomas	Neg. 18 mo.
A. H.	M	51	X	0	X	U	R	2 mo.	X EAW			Pap. ca.	Neg. 1 yr.
M. B.	F	76	X	X[1]	X	X[2]	R	7 yrs.(?) 8 mo.		X		Papillary carcinomatosis	Recurrence 1 yr. (See text)
C. S.	M	61	0	0	X	L	L	2 mo.	X CDC			Two papilloma	Neg. 1 yr.
B D.	F	64	X	0	X	M	L	1 mo.(?)	X			Pap. ca.	Neg. 9 mo.
M. S.	M	72	X	0	X	L	L	22 mo.	X			Squam. ca.	Died 8 mo. (See text)

[1] Renal and vaginal.
[2] Entire ureter except immediately adjacent to pelvis.
[3] Intramural ureter not removed.
[4] Renal cyst, hydroureter. Renal surgery 13 months before definitive surgery.
[5] Calculous pyonephrosis and pyoureter. Renal surgery 14 months before definitive surgery.

Fig. 1.

cent structures. Postoperatively, transurethral resection of the prostate was done and roentgen therapy was given. No local recurrence was discernible at cystoscopy four months later, but the patient died eight months after surgery in terminal uremia with an immense painful liver, presumably due to metastases.

The chart summarizes data in the nine cases described. I gratefully acknowledge the permission to include the cases operated upon by Dr. C. D. Creevy and Dr. E. A. Webb.

SUMMARY

The rather pessimistic attitude prevalent until recently does not seem to be warranted when one compares ureteral neoplasms with many of the more prevalent carcinomas of the genito-urinary and other organs. Education of the public to the danger signal, hematuria, is being accomplished gradually. If the diagnosis is made early and proper therapeutic measures are instituted, papillary lesions should offer a really good prognosis.

CONCLUSION

1. Primary ureteral neoplasm does not appear to be the rare lesion it was once considered.

2. Neither does its prognosis seem to be as grave as earlier opinions would indicate. The lesion tends to follow the pattern of the epithelial tumors of the bladder and renal pelvis. Prognosis depends upon the degree of malignancy, and the extent of the lesion at the time of surgery.

3. A good ureterogram is essential in the judicious treatment of upper urinary tract bleeding despite renal pyelographic deformity. Frequent use of the acorn bulb is suggested.

4. Hydroureter seen at the time of nephrectomy must be adequately explained.

5. Bleeding from the ureteral stump after nephrectomy should be considered as diagnostic of ureteral tumor.

6. One-stage complete nephroureterectomy is the treatment of choice.

Since this paper was presented, a case of infiltrating, undifferentiated carcinoma of the left ureter, 4 centimeters above the bladder, has been seen. This man had been followed for twelve years because of recurrent papillary tumors in the bladder. The pathological diagnosis of the bladder tumors was papilloma except April, 1945, and April, 1947, when papillary carcinoma Grade II was found. Papillary carcinoma Grade I was found in July, 1945. Excretory urogram in April of 1947 was negative. Four papillary lesions since April, 1947, were papillomata.

Since the ureteral lesion was infiltrating in type, it is believed to be primary since infiltrating sessile lesions do not occur in association with papillary lesions. Metastases to the regional nodes were present.

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BOOKS FOR CHILE

The National Committee for Chile, is now receiving gifts for the library of the Medical School of the University of Chile at its new collection center in the Library of Congress, Washington. The newer materials in the library, including periodicals, books and reference materials, were totally destroyed in the recent fire. Medical periodicals of the last ten years and recent medical books are urgently needed. Your contribution will be appreciated.

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A Roentgenometric Study of the Female Pelvis*

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Because of a preponderant number of women of Scandinavian descent residing in this area of the country, it has been alleged that the physician encounters relatively fewer contracted pelves than elsewhere. Almost paradoxically, however, midpelvic arrests are not in the least uncommon. This clinical and roentgenopelvimetric study was conducted both for reasons of geographic comparison and to arrive at a true incidence and recognition of contractions in a particular plane of the pelvis. The shortening of any single diameter, except perhaps for the conjugata vera, loses its importance in favor of a spatial study of each individual plane of the pelvis as a distinct integral part. Also, the finding of normal external measurements may give one a false sense of security in the sense that a troublesome midplane contraction may be overlooked at the time of the original examination. A proper evaluation of this plane, clinically, supported by a roentgenologic interpretation, is not only possible but mandatory to a correct prognosis of labor.

History of interest in the mechanism of labor and the female pelvis dates back to the sixteenth century and to such practitioners as Hippocrates, Celsus and Vesalius.[1] Arantius [4] is thought to be the first to study the contracted forms. The names of Van Deventer,[46] Barton,[7] Smellie,[34] Baudelocque [6] are familiar to all. Hodge,[17] about the middle of the nineteenth century, advanced the presently-accepted principle of the four pelvic planes. Also familiar to you in this vein are Litzmann,[26] Williams,[50] Pinard,[33] Naegele [30] and Michaelis.[29] There have been many advances since Levy-Dorn[25] submitted patients to x-ray exposures of one and one-half hours for the determination of a twin pregnancy. W. F. Manges,[27] I believe, was the first to employ the stereoscopic method of x-ray pelvimetry. Johnson [18–21] followed in 1927 with his version of the parallex method of stereoroentgenopelvimetry. Caldwell and Moloy,[8–14] in introducing their precision stereoscope, made a great contribution as regards cephalo-pelvic relationships and the mechanism of labor to follow. These authors and Thoms, et al.,[35–44] working with the lead grid technique, have contributed practical classifications of the bony pelvis.

Admittedly, morphologic variations of the female pelvis are many and varied. The essential diameters, therefore, of any single plane are essential to the completeness of recognition of adaptability and represent a true index to available space. Their mean averages may be deducted within the limits, for example, of the workable classifications of Caldwell and Moloy, based largely on inlet morphology, of the Gynecoid (normal female), the Android (male), the Anthropoid (ape), and the Platypelloid (flat) types. One may arrive at a clear recognition of these forms, and their respective diameters, through the taking of stereo, inlet, antero-posterior and isometric lateral projection roentgenograms. The "position" method is employed for the various computations. A study of the mean diameters alone is not enough to allow for a high degree of correct prognosis of labor. Such study represents a fixed factor. One must think in terms of adaptability of the fetal head to each successive plane as determined by moldability of the cranial bones, the force of the uterine contractions, soft tissue interference, fascial and ligamentous flexibility, and the direction of the axis of fetal descent. Of probable greater importance is the area in square centimeters of any one plane of the pelvis as determined by Allen.[2] Allen has adopted the plan of Nicholson of working with the square root of the product of the essential diameters. Williams and Phillips [49] and, later, Mengert,[28] have utilized to great advantage lateral and frontal projection charts. According to a scheme by Mengert, a mold, representing the variable sizes of fetal heads, is placed on a chart upon which the essential diameters are projected. These latter methods presumably allow for more accurate prediction of the outcome of labor.

Allow me to briefly enumerate the essential characteristics of the various parent forms of pelves. (Figures in parentheses are those taken from spontaneous deliveries.)

Gynecoid:

Inlet: Round, C.V. 11.5 (11.77) cm.; Trans., 13.0 (13.2) cm.; P.S. 4.0 cm. Area, 117 (121.96) sq. cm. (critical level is 115 sq. cm.). Sum of the C.V. and Trans., 24.4 (24.89) cm.

Midplane: Sidewalls straight—sacrosciatic notch average. Normal sacral concavity. Spines not prominent. A.P., 11.5 (11.76) cm.; I.S., 10.5 (10.53) cm.; P.S., 5.0 (4.10) cm. Area, 94.55 (98.20) sq. cm. (critical level is 90.0 sq. cm.). Sum of A.P. and I.S., 22 (21.94) cm.; of I.S. and P.S., 15.5 (14.53) cm.

Outlet: Wide subpubic angle. Round arch. Biisch., 10.0 (8.66) cm.; P.S., 8.5 (8.16) cm.; Sum, 18.5 (16.82) cm. Critical P.S., 6.5 cm.

Anthropoid:

Inlet: Longitudinally oval. Narrowing of the forepelvis. Transverse shortened, posterior sagittal lengthened. Pelvic tilt of high assimilation type. Long concave sacrum. Sacrosciatic notch wide. Spines blunt and short.

*Inaugural thesis: read before the Minneapolis Academy of Medicine.

Midplane: Narrowing of forepelvis with sacrum pointing well forward.

Outlet: May have contraction.

Platypelloid:

Inlet: Transverse oval in shape.

Midplane: Frequently resembles gynecoid feature with a somewhat narrowed sacrosciatic notch.

Outlet: Although not common, may have narrowed subpubic arch and some sidewall convergence.

Android: (less than a 3 per cent incidence in fertile women).

Inlet: Widest transverse more closely approximates sacral promitory.

Midplane: Forepelvis narrowed. Lateral walls converge. Spines sharp and long. Shortened posterior sagittal. Sacrosciatic notch narrowed in all diameters.

Outlet: Subpubic angle acute. Definite contraction with shortened posterior and biischial.

Mixed:

Incidence varies according to individual interpretation.

The first essential feature refers to the nature of the posterior pelvis, and the lesser-pronounced characteristic is governed by the anterior segment.

Caldwell and Moloy describe five mixed types, namely the anthropoid-gynecoid, the gynecoid-flat, the android-anthropoid, the android-flat, and the android-gynecoid.

The incidence of these various types is given in Table 1.

TABLE 1

Classification	Caldwell & Moloy	Walsh [17] (400 cases)	Sloane Hospital for Women	Pettit et al. [37]
Anthropoid	13	17.25 (14 pure, 3.25 mx.)	22.7	18.0
Gynecoid	45	56.00 (28.25 pure, 27.75 mx.)	50.6	51.0
Platypelloid	6	3.00 (2.75 pure, 0.25 mx.)	4.4	5.0
Android	12	23.75 (12.50 pure, 11.25 mx.)	22.4	21.0
Mixed			1.8	5.0

Sloane Hospital for Women discovered a greater incidence of ample anthropoid and android forms with a fewer number of anatomically characteristic android, anthropoid and platypelloid types. The incidence (Kenny[23]) varies markedly when one confines the study to the suspect pelvis alone. Of the contracted forms the greater number conforms to the platypelloid and the android types, and the least to the anthropoid pelvis.

Although it was not possible to compare the diameters of a series of our own normals, some deductions can be obtained from comparing a group of consecutive cases with those of other authors. (Table 2)

TABLE 2

Pelvic Planes	Ane & Menville [3] (400 consecutive cases)	Judson [22] (53 cases)	Author (450 consecutive cases)	Author (Normal deliveries)
Inlet:	sum	sum	sum	sum
C.V.	11.88 cm. (11.82) cm.	12.60 cm.	11.40 cm.	11.77 cm.
	25.44 cm. (25.44) cm.	26.50 cm.	25.10 cm.	24.89 cm. (24.80) cm.
Trans.	13.56 cm. (13.62) cm.	13.90 cm.	13.70 cm.	13.12 cm.
Area	126.7 sq. cm.	137 sq. cm.	122.3 sq. cm.	121.9 sq. cm.
Midplane:	sum		sum	sum
A.P.	11.41 cm. (11.59) cm.		11.63 cm.	11.76 cm.
	21.71 cm. (22.04) cm.		21.94 cm.	22.90 cm.
I.S.	10.30 cm. (10.45) cm.		10.26 cm.	10.53 cm.
	14.33 cm. (14.96) cm.		14.10 cm.	14.63 cm. (15.70) cm.
P.S.	0.43 cm. (4.51) cm.		3.84 cm.	4.10 cm.
Area	91.7 sq. cm.		94.4 sq. cm.	97.0 sq. cm.
Outlet:	sum			sum
A.P.	11.41 cm. (11.59) cm.			
Biisch.	11.13 cm. (11.23) cm.			9.42 cm.
	18.22 cm. (18.73) cm.			17.40 cm.
P.S.	7.09 cm. (7.05) cm.			7.89 cm.

It will be noted that although our average mean diameter values differ significantly little from those reported by authors studying patients from other areas, the area values are at variance. The inlet areas are smaller and those of the midplane are larger.

What are the indications for requesting a roentgenopelvimetric survey? They may be listed as:

1. The clinical suspect pelvis to include all planes.
2. Primigravida with a large breech; one with unengaged head (especially with occiput posterior position whether or not accompanied by an extension attitude); unengaged head with overriding uninfluenced by extreme lithotomy position and Hillis maneuver.
3. Previous history of serious dystocia.
4. Malpresentations in elderly primipara.
5. Story of fracture or bony disease of the pelvis.
6. Previous cesarean section for disproportion.

Granted the fulfillment of the foregoing indications what have the stereo- and isometric roentgenograms to offer the accoucheur?

1. General morphology and essential diameter values.
2. Nature and degree of contraction present.
3. Depth of engagement of presenting part with a note of degree of clearance; character of the sciatic notch; inclination and angle of the symphysis; sacral features; depth of the posterior pelvis; the transverse diameter of the posterior pelvis; spine characteristics; and the splay of the sidewalls.
4. Multiplicity and attitude of the fetus.
5. Viability and age of the fetus.
6. Location of placenta.
7. After the onset of labor—degree of molding, of lateral flexion, change of station, and adaptation of fetal head to pelvis.

With the presenting part well engaged one's attention is directed to the midplane, the plane of least pelvic diameters. *A midplane contraction should be suspected if any or more of the following conditions accrue.*

1. Constitutionally a male type of patient.
2. An android pelvis, or android influence of other pelvic forms.
3. Prominent or close spines by palpation.
4. Contracted outlet in the presence of a narrowed forepelvis and subpubic angle; and a flat sacrum.
5. Premature rupture of membranes.
6. Malposition (transverse or posterior arrests, with or without full dilatation).

A variety of workable schemes have been adopted by many authors but the most dependable cannot escape the help offered by roentgenopelvimetry, granted a comprehensive impression of cephalopelvic relationships is essential. The android and platypelloid pelves are frequently attended by a poor prognosis while the outlook is favorable in the anthropoid type. A correct prognosis of between 96 and 99 per cent is possible. *The following general rules, when dealing with the suspect pelvis, are worthy of recording.*

1. Trial of labor allowable where a free space of 1 cm. exists between the fetal head and the inlet, provided the midplane and outlet measurements are adequate (Torpin).[45]
2. A platypelloid pelvis with a C.V. of 9.0 to 9.9 cm. is more efficient than an android form that approaches 10.0 cm. (Klingensmith et al.).[24] A C.V. of 11.0 cm. or more is desirable in respect to the latter.
3. Dystocia may be anticipated with a combined C.V. and Trans. of less than 24.0 cm., and a midplane sum of I.S. and P.S. of less than 14.0 cm. In support of this contention Weinberg and Scadron [48] have presented a convincing table. These authors also state that midforceps extractions are common with a summary measurement directed toward 14.0 cm.; that delivery from below is rarely accomplished with a value of 13.5 cm. or less. Our experience has not proven quite as severe as this. A midplane sum of 14.9 cm. was common to their midforceps applications, and one of 15.0 cm. to their cesareanized patients.
4. One may anticipate a dystocia with a C.V. of less than 9.0 cm. and a sum of the P.S. and I.S. of less than 13.5 cm. (Guerriero [16]).
5. Allen, (Table 3), shows that the critical area for the inlet lies at 115 sq. cm. Normal delivery, especially in a standard pelvis, may occur at a 90.0 to 100.0 sq. cm. level. Vaginal delivery is uncertain with levels less than 90.0 sq. cm. If the area

Table 4 (Allen)

Probable Mode of Delivery	Conjuncta vera in mm.	Brim area in sq. cm.	Midplane in sq. cm.	Interspinous in mm.	Post-sagittal (outlet) in mm.
Vaginal delivery certain without evidence of disproportion	Over 130	Over 130	over 120	over 110	over 65
Vaginal delivery certain, but there may be evidence of disproportion needing forceps	105-130	105-130	95-120	90-110	50-65
Vaginal delivery uncertain, and if posssible will show clear evidence of disproportion	90-105	85-105	80-95	80-90	45-50
Vaginal delivery extremely unlikely. Elective cesarean justified	under 90	under 85	under 80	under 80	under 45

or C.V. has a value of less than 105, one should consider performing a cesarean section.

6. The critical levels for the midplane are:
   a. Essential diameters: A.P.—11.3 cm., I.S.—9.5 cm., anterior transverse—10.9 cm.
   b. Areas: 104 sq. cm., using the anterior transverse factor, and 90 sq. cm. employing the I.S. value. Vaginal delivery is uncertain with these values respectively at 85 sq. cm. and 75-70 sq. cm.

There is insufficient time allotted herein for a discussion of the mechanism of labor that may be anticipated in the various contracted forms. The reader, if interested, may refer to a paper to appear in the *American Journal of Obstetrics and Gynecology.*

Because this paper is intended not to deal with particular pelvic forms but with degrees of contraction, a discussion of matters of morphology away from the normal is purposely omitted. With the foregoing figures as presented in Table 2 in mind, it is interesting to follow through to the termination of labor in those pelves of variable degrees of contraction.

The findings derived from the study of the inlet may be tabulated thusly:

Conjugata vera of less than 10.0 cm.

1. Number of cases—16 (4%).
2. Operative deliveries—16 (4%).
   a. Elective cesarean sections—7 (33.76 Gm.) 43.7%.
      C.V. (9.39 cm.) plus Tr. (12.79 cm.) equals 23.18 cm.
      Area equals 94.2 sq. cm.
      } Justified.
   b. Intra-partum cesarean sections—5 (3737 Gm.) 31.2%.
      C.V. (10.8 cm.) plus Tr. (11.6 cm.) equals 22.40 cm.
      Area equals 98.1 sq. cm.
   c. Forceps deliveries—4 (25%).
      High—2 (3375 Gm.) { C.V. (9.3 cm.) plus Tr. (12.3 cm.) equals 21.55 cm. Area equals 89.6 sq. cm.
      Mid.—1 (3280 Gm.) { C.V. (9.6 cm.) plus Tr. (13.6 cm.) equals 23.2 cm. Area equals 102 sq. cm.
      Low—1 (2900 Gm.) { C.V. (9.0 cm.) plus Tr. (11.9 cm.) equals 20.9 cm. Area equals 84.6 sq. cm. Stillborn.

Conjugata vera of 10.0 to 10.5 cm.

1. Number of cases—18 (4.5%).
2. Operative deliveries—15 (3.6%).
   a. Elective cesarean sections—10 (3300 Gm.) 66.66%.
      C.V. (10.25 cm.) plus Tr. (12.47 cm.) equals 22.72 cm.
      Area equals 110.8 sq. cm.
      } Justified.
   b. Intra-partum cesarean sections—3 (3538 Gm.) 20%.
      C.V. (10.27 cm.) plus Tr. (12.28 cm.) equals 22.55 cm.
      Area equals 99.2 sq. cm.
      } Understandable.
   c. Forceps deliveries—2 (3368 Gm.) 13.3%.
      High axis traction.
      C.V. (10.2 cm.) plus Tr. (12.7 cm.) equals 22.9 cm.
      Area equals 101 sq. cm.
      } Understandable.
3. Spontaneous deliveries—3 (3085 Gm.). One breech.
   C.V. (10.3 cm.) plus Tr. (13.46 cm.) equals 23.76 cm.
   Area equals 108 sq. cm.
   } Understandable.

C.V. and sum of C.V. plus Tr. greater than 10.67 and 23.9 cm. respectively

1. Seven elective cesarean sections (3370 Gm.) with a mean area of 110.6 sq. cm. might have been allowed a test of labor.
2. Three intra-partum cesarean sections (3606 Gm.) were done after an average of 41 hours of labor with no progress. The mean area value was 106.4 sq. cm.
3. There were ten other cesarean sections and eight midforceps deliveries. These were accounted for by reasons of previous cesarean sections, breech presentations, and an accompanying midplane crowding as an expression of android and small gynecoid influence.

Findings derived from the midplane study:

Midplane sum of I.S. plus P.S. of less than 13.0 cm.

1. Number of cases—49 (12.2%).
2. Operative deliveries—46 (94%).
   a. Elective cesarean sections—27 (3375 Gm.) 58.7%.
      A.P. plus I.S. equals 20.16 cm.
      I.S. plus P.S. equals 12.12 cm.
      Area equals 79.1 sq. cm.
      } Justified.
   b. Intrapartum cesarean sections—2 (3964 Gm.) 4.3%.
      A.P. plus I.S. equals 21.5 cm.
      I.S. plus P.S. equals 12.7 cm.
      Area equals 68.2 sq. cm.
      } Understandable.
   c. Difficult midforceps—17 (3514 Gm.) 4.3%.
      A.P. plus I.S. equals 20.36 cm.
      I.S. plus P.S. equals 12.34 cm.
      Area equals 80.8 sq. cm.
      } Understandable.
   d. Spontaneous deliveries—3 (3173 Gm.) 0.75%.
      A.P. plus I.S. equals 20.83 cm.
      I.S. plus P.S. equals 12.57 cm.
      Area equals 83.8 sq. cm.

Midplane sum of I.S. plus P.S. of 13.0 cm. to 13.5 cm.

1. Number of cases—14 (3.5%).
2. Operative deliveries—13 (93%).
   a. Elective cesarean sections—4 (3494 Gm.) 31%.
      A.P. plus I.S. equals 21.78 cm.
      I.S. plus P.S. equals 13.16 cm.
      Area equals 94.7 sq. cm.
      } Test of labor indicated?
   b. Intrapartum cesarean sections—1 (4048 Gm.) 7.7%.
      A.P. plus I.S. equals 20.9 cm.
      I.S. plus P.S. equals 13.1 cm.
      Area equals 84.4 sq. cm.
      } Understandable.
   c. Mildly difficult midforceps—8 (3585 Gm.) 61%.
      A.P. plus I.S. equals 20.97 cm.
      I.S. plus P.S. equals 13.53 cm.
      Area equals 85.9 sq. cm.
      } Understandable.
   d. Spontaneous deliveries—1 (3480 Gm.) 7.7%.

Added to the above study is the following survey of an additional fifty cases. This review differs in that the graduated break-down concerns primarily the mean area values. The interspinous measurement is used in computing the midplane area except where indicated. The analysis agrees favorably in every instance.

Areas of 95 to 100 sq. cm.

Number of cases—9. Average mean area—97.39 sq. cm.
Elective cesarean sections—4 (3124 Gm.).
   a. Two accompanying midplane contractions—81.5 and 64 sq. cm., using the I.S. diameter. Android character.
   b. One pelvic fracture—oblique contraction.
   c. One breech presentation (2760 Gm.).

Intrapartum cesarean section—1 (2130 Gm.)—Ablatio.

Midforceps—1 (2700 Gm.). Midplane area of 73.5 sq. cm.—understandable (Android).

Outlet forceps—1 (3180 Gm.). Midplane area of 79.5 sq. cm.—understandable. Small gyn.-flat.

Spontaneous—2 (3497 Gm.). Midplane area of 88.0 sq. cm. Flat.

No prolonged labors.

Comment: Expression of less favorable android and more favorable flat types of pelves. (There was one android pelvis with areas of the inlet and midplane respectively of 83.9 and 70.6 sq. cm.).

Areas of 100 to 105 sq. cm.

Number of cases—10. Average mean area—102.2 sq. cm.

Elective cesarean section—1 (2661 Gm.). Flat—test of labor allowable.

Intrapartum cesarean section—1 (4048 Gm.). Android—arrest understandable.

Outlet forceps—4 (3124 Gm.). Midplane area 88.5 sq. cm.

Spontaneous—4 (3194 Gm.). Miplane area 87.7 sq. cm. (one 74.4—Pit.).

No prolonged labors.

Comment: The flat type of pelvis was again suggested in the uncomplicated.

Areas of 105 to 110 sq. cm.

Number of cases—4. Average mean area—108.1 sq. cm.

Elective cesarean section—1 (4140 Gm.). Flat—unengaged head.

Outlet forceps—2:

a. One—4140 Gm. Midplane area—90.5. Scanzoni.

b. One—3690 Gm. Midplane area—85.5. Gynecoid-flat.

Spontaneous delivery—1 (3210 Gm.). Midplane area—106.0. Flat.

No prolonged labors.

Comment: Favorable gynecoid character in a flat pelvis.

Areas of 110 to 115 sq. cm.

Number of cases—8. Average mean area—115.5 sq. cm.

Elective cesarean section—1 (2970 Gm.). Midplane area—91.7 sq. cm. Previous section.

Intrapartum cesarean section—1 (3000 Gm.). Average mean area—85.5 sq. cm. Asynclitism.

Three prolonged labors (average number of hours was 67).

All uterine inertias:

a. One midforceps (Scanzoni) (4170 Gm.). Midplane area—91.0 sq. cm.

b. One low midforceps (Scanzoni) (3030 Gm.). Midplane area—96.0 sq. cm.

c. One low forceps (3480 Gm.). Midplane area—99.9 sq. cm.

Midforceps—1 (3615 Gm.) (Scanzoni). Midplane area—88 sq. cm. (ant. transverse of 106 sq. cm.). P.S. of outlet of 6.5 cm.

Low-midforceps—1 (3737 Gm.). Midplane area—76.9 sq. cm.

Outlet forceps—1 (3539 Gm.). Midplane area—99.9 sq .cm.

Comment: All above terminations understandable.

Areas of more than 115 sq. cm.

Number of cases—18. Average mean area—122. sq. cm.

Elective cesarean sections—8 (3258 Gm.). Midplane area—82.0 sq. cm.

a. One—complicating pulmonary tuberculosis.

b. Two mild and two moderately severe midplane contractions (sums of P.S. and I.S. diameters of less than 13.0 cm.). Difficult midforceps deliveries were anticipated.

c. One—an accompanying P.S. of the outlet of 3.0 cm.

d. Two—borderline midplane area values—85.9 sq. cm. (3512 Gm.).

Outlet forceps—6 (3367 Gm.). Midplane area—86.15 sq. cm.

Breech delivery—1 (3640 Gm.). Midplane area—83.6 sq. cm. Stillborn.

Spontaneous deliveries—3 (3648 Gm.). Midplane area—84.2 sq. cm.

No prolonged labors.

Comment: All understandable except for two elective cesarean sections (d). These patients may have been allowed to go into labor.

Summary

A critical survey is presented of those pelves referred for roentgenopelvimetric study because of a suspicion of some degree of cephalopelvic disproportion. The mean diameters and area values are compared with similar statistics as related by other authors. The mean inlet areas compare reasonably well but this series of cases reveals a somewhat larger midplane capacity.

The degrees of contraction found in this study are graduated and the difficulties encountered obstetrically therein are enumerated. The mean average weights of the babies are correlatedly included. From the knowledge gained thereby certain rules for confidently offering a prognosis of labor are proposed. The area value for each pelvic plane appears to be helpful in this regard, except, perhaps, the consideration of the sum of the antero-posterior and the widest (anterior) transverse diameters of the midplane, than any one scheme concerned with merely summarizing any two diameters.

It is hoped that continued interest in this subject will serve to lessen the incidence of maternal morbidity and mortality, to allow for a greater fetal salvage, and to clarify the election of performing a cesarean section.

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AMERICAN ASSOCIATION OF BLOOD BANKS ANNUAL MEETING

The Second Annual Meeting of the American Association of Blood Banks will convene in Seattle, Washington, at the Olympic Hotel, November 3, 4, 5, 1949. An excellent program is being arranged which will be of interest to both scientific and administrative personnel of blood banks and hospitals. Dr. Julius W. Davenport Jr., Director of the Blood Plasma Service, Southern Baptist Hospital, 2700 Napoleon, New Orleans, Louisiana, is chairman, and Dr. Paul I. Hoxworth, University of Cincinnati College of Medicine, Cincinnati General Hospital, Cincinnati, Ohio; Mr. Charles G. Ransom, Director of the Blood Bank Foundation, 1911 Broadway, Nashville 4, Tennessee; Dr. Joseph Porter, Maine General Hospital, Portland, Maine; and Dr. William Levin, John Sealy Hospital Blood Bank, 816 Strand, Galveston, Texas; are members of the Program Committee. The King County Central Blood Bank of Seattle will be host to convention delegates.

Dr. Ralph G. Stillman, 351 East 68th Street, New York 21, New York, President of the Association, states he is confident there will be many interesting and informative papers. Further, it is anticipated that a program will be presented for means of cooperation of all blood banks in the country for united action in case of emergency or national disaster. Although the distance for some will be great, said Dr. Stillman, the trip will be interesting and it is believed we can safely promise that you will find the meeting well worth your while.

For further information contact the Office of the Secretary, 3301 Junius Street, Dallas 1, Texas.

NATIONAL CANCER INSTITUTE GRANTS

National Cancer Institute grants of $1,026,294 to finance laboratory and clinical research in cancer were announced June 28 by Oscar R. Ewing, Federal Security Administrator.

The grants extended to the University of Minnesota were for the study of the biology of human breast cancer, the relation of gastritus to cancer of the stomach, the Cancer Detection Center, and courses in cancer nursing and cancer control. Doctors who were particularly designated to carry out the research are Sheldon C. Reed, Robert Hebbel, Owen H. Wangensteen, and David State.

Chronic Pulmonary Emphysema and Cor Pulmonale*

Richard V. Ebert, M.D.
Minneapolis, Minnesota

Chronic pulmonary emphysema is a disease which is of importance to the practitioner of medicine because it is a common cause of great physical incapacity and suffering and to the surgeon because, if unrecognized, it may lead to death following thoracic or abdominal surgery. In spite of the fact that pulmonary emphysema is a common disease it is frequently overlooked or an inaccurate diagnosis made. Laennec [1] in 1819 clearly outlined the basic features of the disease.

"The general symptoms of this affection are rather equivocal. Dyspnea being its most striking feature, it is one of the diseases usually confounded under the name of asthma. In it the respiration is habitually impeded, but is aggravated by occasional paroxysms which are quite irregular in their return and duration. Like dyspnea from any other cause it is further increased by the usual causes, such as indigestion, mental emotion, elevated situation, violent exercise, especially that of mounting, etc. It is unaccompanied by any fever, and the pulse is, for the most part, regular. When the affection exists in a high degree, the skin assumes a dirty aspect, with a bluish tint in some places, especially the lips. In all the cases I have seen there was a slight degree of habitual cough, with a very slight mucous expectoration. . . . Like other dyspneas it frequently, in the end, gives rise to hypertrophia or dilatation of the heart."

Why is the diagnosis of chronic pulmonary emphysema so frequently overlooked in view of the clear delineation of the signs and symptoms by Laennec? It would seem to be because the symptom of dyspnea which is so characteristic of this disease brings to the mind of the physician the diagnosis of cardiac failure or bronchial asthma. Yet the dyspnea of emphysema can usually be readily differentiated from the dyspnea of cardiac failure by a study of the cardiac silhouette in the roentgenogram of the chest and by examination of the electrocardiogram. In left ventricular failure the left ventricle of the heart is almost invariably enlarged whereas in emphysema the cardiac shadow usually appears small in the posterior anterior view and if enlargement is present, it is chiefly of the right ventricle. The electrocardiogram in left ventricular failure reveals a left strain pattern or evidence of myocardial damage, while in emphysema the electrocardiogram is normal or shows a right strain pattern, and often high P waves in leads 2 and 3 are present. In mitral stenosis with associated dyspnea the heart may appear normal in size but the characteristic murmur readily identifies the valvular lesion. The dyspnea of bronchial asthma may be differentiated from that of pulmonary emphysema in that it is paroxysmal in character. Between attacks the patient with asthma should be free of dyspnea even on exertion. If chronic dyspnea is present pulmonary emphysema should be suspected.

The physical findings in emphysema may also be misleading. It is true that the so-called barrel chest with increase in anteroposterior diameter, flared costal margins, hyperresonance, and obliteration of the cardiac dullness may be found in true chronic pulmonary emphysema. Unfortunately a similar change in the chest may occur in certain older individuals whose lungs function entirely normally.[2] Moreover, certain patients with chronic pulmonary emphysema do not exhibit a typical barrel chest. The change in breath sounds may be helpful but is not usually decisive in diagnosis. The roentgenogram of the chest often fails in diagnosis of this disease although it may be of great aid especially if large blebs are present. Fluoroscopic observation of the diaphragm may reveal it to be flattened and low in position with only slight motion with respiration.

An understanding of the pathologic physiology of emphysema may aid in the recognition of the disease and in the management of the patient. Before discussing emphysema a few comments are necessary on the normal physiology of respiration. The basic function of the lungs is to supply oxygen to the blood and to excrete carbon dioxide. This is accomplished by an interchange of gas between the alveoli and capillaries. The respiratory movements of the chest are designed to ventilate the alveoli so as to constantly introduce O_2 and remove CO_2. The partial pressure of O_2 in alveolar air is normally 100 mm. Hg. and the partial pressure of CO_2 40 mm. Hg. Increasing ventilation causes a fall in the CO_2 tension and a rise in O_2 tension in alveolar air, providing the metabolic rate remains constant. In normal persons the chemical regulation of respiration maintains the partial pressure of O_2 and CO_2 in alveolar air relatively constant. The partial pressure of O_2 and CO_2 in the arterial blood is nearly identical with that in the alveolar air, there being no appreciable gradient for CO_2 and only a slight gradient for O_2 across the alveolar membrane.

In chronic pulmonary emphysema we find a marked impairment of pulmonary function. The vital capacity is reduced. This reduction is the result of an increase in the residual air, by which is meant the air which remains in the lungs at the end of a complete expiration.[3,4] The total lung volume is essentially normal. The ability to increase ventilation is more markedly impaired than the vital capacity might indicate. This is

*Inaugural thesis; presented at the Minneapolis Academy of Medicine March 21, 1949.

because it requires a prolonged period of time to expel the air from the lungs due to their loss of elasticity. Recently the ability to increase ventilation has been emphasized as a test for pulmonary function.[5] A normal person can increase his ventilation as much as 20 times or to 100 liters per minute. A patient with severe pulmonary emphysema is fortunate if he can double his ventilation.

The alveoli in chronic pulmonary emphysema are poorly ventilated. As a result the O_2 tension and O_2 saturation of the arterial blood is low. In severe cases the O_2 saturation of the arterial blood may be as low as 70 per cent. The CO_2 tension of the arterial blood is usually increased. To compensate for this increase there is an increase in the bicarbonate of the blood with the result that the pH is normal or only slightly decreased. In extreme cases the total CO_2 of the blood may rise to over 100 volumes per cent. Attempts at hyperventilation are usually ineffective in increasing the O_2 tension or lowering the CO_2 tension of the arterial blood. It is apparent that exercise by increasing the demand for O_2 and the formation of CO_2 will further accentuate the disturbance in the tension of these gases in the blood.

Finally a note should be made as to the effect of chronic pulmonary emphysema on the circulation. It has been known for many years that this disease may lead to right ventricular hypertrophy and that right heart failure may occur as a complication. Recent studies [6] have shown that elevation of the pulmonary arterial diastolic pressure is a constant finding in pulmonary emphysema. Usually the elevation in pulmonary arterial pressure is mild but in a few cases it may be marked. Those cases with the most marked elevation appear to be prone to develop right heart failure.

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AMERICAN COLLEGE OF CHEST PHYSICIANS MEETING

Dr. Charles B. Craft, Bozeman, Montana, was elected Governor of the American College of Chest Physicians at the Fifteenth Annual Meeting held in Atlantic City, New Jersey, June 2-5, 1949.

Many other Northwest doctors were represented at this meeting. Doctors David Carr, H. Corwin Hinshaw, Karl H. Pfuetze, and H. A. Brown, of Rochester, Minnesota, presented a paper on "The Use of Dihydrostreptomycin in the Treatment of Tuberculosis." Dr. John R. McDonald, also of Rochester, presented a very interesting paper on "Carcinoma of the Lung, Its Diagnosis by Cytologic Examination of Sputum and Bronchial Secretions."

A small number of physicians received a fellowship certificate at the convocation held June 4 in connection with the A. C. C. P. meeting. This honor was extended to Dr. Paul J. Breslich of Minot, North Dakota.

MISSISSIPPI VALLEY MEDICAL SOCIETY MEETING AT ST. LOUIS, SEPTEMBER 28, 29 and 30

The 14th Annual Meeting, Mississippi Valley Medical Society, will be held at the Jefferson Hotel, St. Louis, Sept. 28, 29, 30, under the Presidency of Dr. Alphonse McMahon, Associate Prof. of Medicine, St. Louis University. Over 30 clinical teachers from the leading medical schools will conduct this great post-graduate assembly whose entire program is planned to appeal to general practitioners. There will be some 60 scientific and technical exhibits, noon round-table luncheons, etc. No registration fee will be charged and every ethical physician is cordially invited and urged to attend. The entire program and all exhibits will be held on the mezzanine floor of the Jefferson Hotel. The American Medical Writers' Ass'n. will hold their annual meeting at the hotel on Sept. 28 and the Missouri Chapter of the American Academy of General Practice on Sept. 30. Programs of all the meetings may be obtained from Harold Swanberg, M.D., secretary, M. V. M. S. and A. M. W. A., 209-224 W. C. U. Building, Quincy, Ill.

American College Health Association News

The Problem of Control of the Respiratory Tract Infections

Clayton G. Loosli, M.D.*
Chicago, Illinois

In the past ten years, great progress has been made in the treatment of respiratory tract infections. At the present time, however, there is no effective practical means of preventing this group of diseases in individuals in the industrial plant, office, school, or home. The development of effective means of control is limited, among other factors, by insufficient knowledge concerning the nature of the etiological agents, clinical manifestations, and modes of spread of acute respiratory tract infections.

Etiology and Clinical Manifestation: In the routine practice of medicine, the great majority of acute respiratory tract infections go undiagnosed so far as etiology is concerned. They are usually characterized as "virus infections" which may vary clinically from the "simple common cold" to severe atypical pneumonia.[1,2] From studies on the transmission of acute respiratory infections in man by the Commission on Acute Respiratory Diseases,[3] it appears that several different viruses may produce the same symptom complex of the "common cold." As yet, however, these virus agents are uncharacterized and have not been isolated for study in the experimental animal. Recent reports announcing the isolation of virus agents from patients showing symptoms of the "common cold" by the fertile egg technique are encouraging.[4,5] During transmission experiments, however, similar symptoms could also be elicited by sterile inocula. Transmission experiments by the Commission on Acute Respiratory Diseases showed only a short period of immunity to the "common cold virus". Although it is recognized that certain bacterial agents (Beta hemolytic streptococci and pneumococci) may elicit upper respiratory tract infections, the part the common bacterial flora of the nose and throat plays in the etiology and course of these diseases is not clear.

Modes of Spread: The causative agents of acute respiratory infections are harbored in the upper air passages of ill and asymptomatic carriers. It is now well-known that individuals, whether ill or not, continually extrude bacteria in droplets into the surrounding environment during the course of talking, sneezing, laughing, coughing, and blowing the nose.[6,7,8,9] Jennison has demonstrated the expulsion of droplets during the above activities (Figs. 1 and 2). The droplet-carrying bacteria vary greatly in size. The large ones fall quickly and become components of dust, while the smaller ones evaporate and become droplet nuclei (Fig. 3). Not only does the dust on the floor, desks, table tops, and in the air become soiled, but also the handkerchiefs, clothes, hands (Fig. 4), etc., of the "dispenser" become highly conatminated.[8,10,11,12,13] Presumably, the virus agents of respiratory tract infections are dispersed into the environment in a like manner.



Fig. 1. Droplets resulting from a cough. Only a few hundred droplets are produced in a cough compared with thousands in a sneeze. (Published through the courtesy of Dr. M. W. Jennison and the American Association for the Advancement of Science. From Aerobiology, No. 17, p. 120, 1942.)



Fig. 2. Sneeze from subject with a head cold. The strings of mucus are clearly evident. The large droplets result in part from less effective atomization of these viscous secretions. (Published through the courtesy of Dr. M. W. Jennison and the American Association for the Advancement of Science. From Aerobiology, No. 17, p. 116, 1942.)

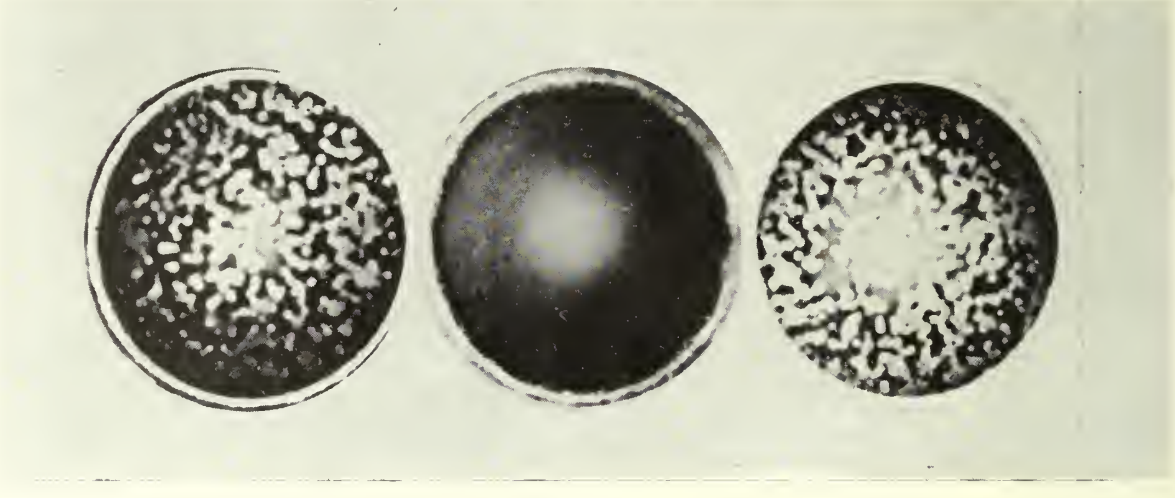
In intramural environments such as homes, classrooms, dormitories, factories, offices, and hospitals, where people congregate and spend several hours of the day, the

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HEMOLYTIC STREPTOCOCCI RECOVERED FROM THE AIR OF A PHARYNGITIS-TONSILLITIS WARD



Fig. 3. Photographs of blood agar plates made from bacterial air samples in a ward during varying degrees of activity. The streptococci shown in each plate represent only a small percentage of the total number recovered from the 10 cubic feet of air drawn through the collecting broth. (Published through the courtesy of Dr. Morton Hamburger, Jr., who collected these data.)



(1) (2) (3)

Fig. 4. Photographs of blood agar plates made by inoculating aliquots of nutrient broth in which the nasal carrier washed his hands. (1) Culture before washing. (2) Culture immediately after scrubbing hands thoroughly with soap and water and rinsing in alcohol. (3) Culture after blowing nose. (Reproduced through the courtesy of Dr. Morton Hamburger, Jr., and the Journal of Infectious Diseases, 79:39, 1946)

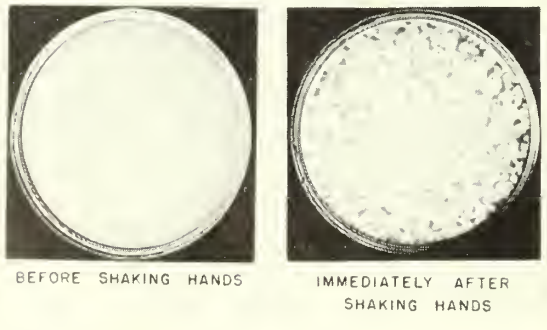


Fig. 5. Photographs of blood agar plates made by inoculating aliquots of nutrient broth in which recipient washed hands before and after shaking soiled hands of "nasal disperser" of hemolytic streptococci. (Published through the courtesy of Dr. Morton Hamburger, Jr., who collected these data.)

bacterial and viral content may reach a high level. Although respiratory tract infections have been considered in recent years to be spread principally by the breathing of airborne agents in dust and droplet nuclei,[14] in such environments other modes of transmission such as direct contact (kissing, handshaking) with an infected person or by contact with contaminated objects (clothes, pencils, dusty desk surfaces, etc.) must be considered.[15–19] Hamburger and associates[8,8a] have graphically demonstrated the potential role of the hands in the spread of streptococcal infection (Fig. 5). Robertson[12] points out that we have no knowledge as to what percentage of colds, diphtheria, streptococcal disease, meningitis, pneumonia, and tuberculosis is acquired by breathing in the infectious agents and what percentage occurs as a result of other means of inoculation. The opportunity for intimate contact among students in the elementary,

high school and college environments is manifold, and all modes of spread undoubtedly operate in the transmission of respiratory infections but vary in importance with the different age groups, diseases, and seasons of the year.

In recommending methods of prevention of respiratory tract infections, knowledge of the activities of the individual and the different environments under which they live is necessary. Baetjer points out that employees spend only about one-third of their time at work and that their chances of acquiring infections outside industry are equally high.[21] Likewise, college students spend only a portion of the day in the crowded classroom and the chance of acquiring a "cold" while at the "coffee shop," a "gab-fest" in the dormitory, a sorority or fraternity meeting, or while on a "date" is also equally great.

Methods of Control

No fully successful program of respiratory disease control has been developed. Certain recommendations based on knowledge of the possible modes of spread have been made. The spread by contact and droplets is subject to control by altering individual activity such as the promotion of personal hygiene, isolation, and quarantine, and by increasing individual resistance by chemoprophylaxis and vaccination. The spread of infection by droplet nuclei and dust is amenable to control by methods of air sanitation.

Personal Hygiene

In the light of our knowledge of the manner of dispersal of respiratory disease pathogens, good health habits are essential for the protection of the individual and his associates. Of first importance are habits of cleanliness, such as: (a) avoidance of spitting *(if it must be done,* use a handkerchief or disposable tissue); (b) avoidance of coughing, sneezing, and blowing the nose without protection of face with handkerchief or disposable tissue; (c) frequent washing of hands and face with ample soap and water, particularly following sneezing, coughing, and blowing the nose; (d) frequent bathing and the wearing of clean clothes (outer as well as inner garments). Good habits of sleeping and eating regularly a well-balanced diet promote well-being and possibly resistance to respiratory infections. Reporting to the physician or nurse at the early onset of illness for prompt treatment diminishes the risk of serious complication and spread of infection to others.

Isolation and Quarantine

The value of these procedures in preventing the spread of certain contagious and infectious diseases throughout the community, hospital, and school is well established. The isolation at home of nursery school and kindergarten children, shown on morning inspection to have a beginning "cold" or contagion, is a routine practice. The carrying out of isolation procedures to prevent the spread of respiratory tract infection in the elementary, high school, and college student is the responsibility of the individual and parents. College students with "colds" continue to attend classes often throughout the course of illness or until serious symptoms develop, for their desire to keep up with class work is usually greater than their immediate concern for health or their ability to spread colds to others. There is no arrangement for the student to take sick leave without penalty as there is for the industrial worker. As Robertson points out, the isolation of the vast majority of ambulatory persons afflicted with common respiratory infections is impractical.[20]

Chemoprophylaxis

The routine use of antibiotics or chemotherapeutic agents for the prevention of bacterial respiratory infections needs further study. It has been shown by Hamburger and associates [22] and Loosli [23] that both penicillin and sulfadiazine markedly alter the bacterial flora of the nose and throat and decrease the number dispersed into the environment. At the same time, the use of these agents should provide an unfavorable surface on the mucous membranes for the implantation of inhaled organisms.

In the case of streptococcal, meningococcal, or diphtherial outbreaks, the mass prophylactic use (in therapeutic doses) of penicillin in preventing the spread among the contacts seems warranted. The giving of small doses of sulfadiazine by the Navy for mass prophylaxis over a long period of time against streptococcal infection resulted in the production of highly virulent sulfonamide-resistant strains of hemolytic streptococci.[24,25] Therefore, the routine use of sulfonamides or penicillin in small doses over long periods should be discouraged.[26] There is no evidence that the use of antibiotics reduces the incidence of the common cold and other virus infections of the respiratory tract.[27]

Vaccination

The Common Cold and Bacterial Infections. There is no specific vaccine for the common acute respiratory infections of virus and bacterial origin. The use of bacterial vaccines containing respiratory disease pathogens and common flora of the nose and throat has not proved effective. Studies by Diehl and associates[28] have shown that such preparations given either orally, subcutaneously, or instilled into the nasal passages elicit no specific resistance to respiratory tract infections. Summarizing the accumulated data up to December, 1944, on the use of bacterial vaccines, the Council on Pharmacy and Chemistry and the Council on Industrial Health of the American Medical Association [29] conclude that "Decisive evidence of the value of any vaccine is not forthcoming and the weight of careful studies clearly indicates that none of the vaccines now available when administered by routes advised have proved of value." Therefore, vaccines for "colds" cannot be recommended for administration to industrial groups, student groups, or to individuals. Any attempt to prevent colds by the use of bacterial vaccines must be considered purely experimental. Likewise, there is no evidence that vaccination with Influenza A & B virus vaccines protects against the "common cold" or respiratory infections of bacterial origin.

Epidemic Influenza: Studies by Francis, Hirst, and other members of the Influenza Commission on the use of influenza virus vaccines during the 1943 [30] and 1945 [31,32] epidemics were highly successful. Employing

the same polyvalent vaccine during the 1947 epidemic, a number of investigators [33,34] found no such dramatic protection following vaccination. Failure to demonstrate the usefulness of the vaccine during the 1947 epidemic was found to be due to the absence of a close antigenic relationship between the viruses in the vaccine and the strains causing the epidemic. The efficiency of influenza virus vaccines will depend then (1) on their ability to initiate an adequate antibody response and (2) on a close antigenic relationship between the virus components in the vaccine and those initiating the epidemic. The limitations of influenza virus vaccines then become obvious.

The gravity of the problem of the control of epidemic influenza has resulted in the establishment of a World Influenza Control program through the World Health Organization. The Influenza Information Center in the United States is located in the National Institutes of Health, Bethesda, Maryland.[35] Such an organization, with laboratories in various parts of the world, may make it possible to isolate in sporadic outbreaks, virus strains which may be incorporated into vaccines in advance of the epidemic spread of this disease. Student and industrial populations provide excellent groups for the evaluation of influenza vaccines.[33,34] Such investigations should be encouraged.

Scarlet Fever: Top [36] points out that immunization against scarlet fever in the face of present knowledge seems illogical. Scarlet fever over the past ten years has become relatively mild. Injection of the toxin, in spite of improvement in quality, often elicits moderate to severe reactions. Immunization with the erythrogenic toxin only protects against the rash but does not prevent the septic complications which may follow streptococcal infection with or without a rash. Strains and types of Beta hemolytic streptococci vary in their ability to produce scarlet fever. Hamburger and associates [37] have shown that carriers of a given type of streptococcus are able to transmit scarlet fever even though the carrier himself has no rash. Conversely, cases of streptococcal pharyngitis and tonsillitis are contracted from cases of scarlet fever. During these studies, they found that there was no significant difference in the numbers of streptococci dispersed into the environment by patients with scarlet fever and those with pharyngitis or tonsillitis without rash.

The many clinical and epidemiological studies of streptococcal infections point to the fact that the existing quarantine laws governing scarlet fever patients are in need of revision. It should be remembered, as Top emphasizes, that scarlet fever is but one of a number of hemolytic streptococcal infections; therefore, there is no sound basis to quarantine only contacts to patients with erythrogenic rash.

Diphtheria: Vaccination with toxoid for the protection of diphtheria is well established and needs no further comment. Immunization against diphtheria should be a routine preventive measure in pediatric practice and in student and industrial health service clinics. All employees and students should be encouraged to have booster doses periodically.

Pneumonia: Because of the large number of specific types of pneumococci and the wide variety of other organisms which may cause pneumonia, little attempt has been made in the past to develop vaccines for its prevention. During World War II, the high incidence of pneumonia among the personnel in a certain military installation provided MacLeod and associates [38] an opportunity to evaluate the use of vaccines prepared from the most prevalent pneumococcal types found in the noses and throats of the camp population. It was shown that purified pneumococcal capsular polysaccharides of Types I, II, V, and VII employed as immunizing agents reduced the carrier rate and the incidence of pneumonia caused by these types. Kaufman [39] has recently reported a study confirming the value of vaccinating older individuals living in an institution with polyvalent pneumococcus polysaccharides I, II, and III for the prevention of pneumococcal pneumonia.

During the past ten years, however, there has been a marked and steady decline in deaths due to pneumonia from all causes. Some individuals consider this low mortality rate due to the extensive use of sulfonamides and antibiotics in the treatment of acute upper respiratory tract infections. Because of the low incidence of pneumococcal pneumonia, the large number of types which may cause the diseases, and the lack of knowledge concerning the duration of immunity following vaccination, the wide-spread application of immunization with polysaccharides is not justified. MacLeod [38] recommends such vaccines for workers in industrial environments in which crowding, poor ventilation, and dust favors the spread of the disease. As Kaufman [39] has shown, it would appear to be desirable to vaccinate individuals living for long periods of time in hospitals and other institutions.

Hygienic Surroundings

The potential hazard of a dirty environment is great. A clean environment in which to live, work, and study will promote personal cleanliness. Clean toilet facilities with ample soap and disposable or clean towels should be readily available. For the comfort of the individual, good lighting and ventilation, with appropriate temperature and humidity of the environment, are important.

Crowding and Ventilation: Other factors being equal, the bacterial content of air in enclosed spaces is roughly proportional to the number of individuals present. Therefore, the overcrowding of classrooms and dormitories increases the opportunity for spread of respiratory infections both by contact and indirectly by droplet nuclei and airborne dust. Much can be accomplished in keeping the bacterial content of the air below the infective level by adequate ventilation.[40]

Air Disinfection: In addition to ventilation, three methods have been employed for the prevention of the spread of infection by droplet nuclei and dust. They are ultraviolet irradiation,[41–44] chemical disinfection with triethylene glycol vapor,[20,27] and dust suppression procedures.[15,16,17,45] These procedures when adequately applied reduce the bacterial content of the air from 60 to 85 per cent. They have been evaluated principally with respect to their efficiency in preventing respiratory

tract infections and contagious diseases in hospitals, schools, and military barracks.

Of the three, dust suppression by the application of oil to floors, bedclothes, and wearing apparel is most easily applied and is recommended as a measure of good housekeeping. On the basis of available data, recently reviewed by the Committee for the Evaluation of Methods to Control Airborne Infection of the American Public Health Association, the general use of ultraviolet irradiation and triethylene glycol vapor is not recommended.[46] No information is available as to their effectiveness when used in the home, office, school, or factory. Therefore, any application of these methods should be considered experimental. In areas or environments where the evidence of respiratory tract infections is high, further careful studies of the use of these methods are encouraged. Ultraviolet irradiation and triethylene glycol vapor should be evaluated in relation to other means of control of respiratory tract infections, such as the use of antibiotic agents.[27]

Treatment

As there is no effective over-all method for preventing respiratory tract infections, the question of treatment becomes important.[2] In the early stages, it is impossible to predict the course of respiratory tract infections. Therefore, prompt reporting to the physician for care is important. Most upper respiratory tract infections are mild and treatment is symptomatic. The use of antibiotics should be limited to the more severe infections where there is definite evidence or question of a bacterial etiology. The use of aureomycin in the treatment of primary atypical pneumonia is recommended.[47]

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American College Health Association News

The Executive Committee of the American College Health Association has accepted the application for membership of the following institutions: Jersey City Medical Center—Dr. Leonhard Felix Fuld, Director, Jersey City 4, New Jersey; University of Texas Medical Branch—Dr. John W. Middletown, Director Student Health Service, Galveston, Texas; Colorado School of Mines—Dr. W. Lloyd Ulright, Director, Golden, Colorado. The final election to membership of these institutions will be made by a vote of the delegates at the annual meeting in December, 1949.

The one volume Proceedings of the twenty-fifth and twenty-sixth annual meetings is just off the press. The Council voted to send one copy to each member institution. This copy has been mailed to the Director of Health Service. If the college library or an individual desires a copy of the Proceedings, it will be necessary to order one. The price is $3.00. Back copies of the Proceedings are available for any institutions desiring to make the files complete. These copies may be obtained from the secretary for fifty cents each.

Virginia Polytechnic Institute, Blacksburg, Virginia, reports a vacancy in the directorship of the College Health Service. The college has over five thousand students, an infirmary with fifty beds, a staff of two full-time and one half-time physicians, two orderlies, five registered nurses, and three student assistants. Write to Dr. Charles R. Woolwine for further information.

A full-time physician is needed in September at Yale University, Department of Health, New Haven, Connecticut. Write to Dr. Orville F. Rogers for further information.

The Ohio College Health Association, the Ohio Section of the American College Health Association, held the twenty-fifth annual meeting of the Association in April at Columbus, Ohio. Forty-three representatives from seventeen colleges and universities attended the two-day meeting. The name of the organization was changed to conform with the parent association. The officers of the Section are:

President—Dr. E. Herndon, Ohio University; vice-president—Dr. Ted Allenbach, Ohio State University; secretary-treasurer—Dr. William T. Palchanis, Ohio State University.

The secretary reports a feature of the meeting was the organization of the college health nurses into the Nursing Section of the Ohio College Health Association. This Nursing Section is probably the first of its kind to be affiliated with any local section of the American College Health Association. The following officers were elected:

Chairman—Mrs. Rena E. Coppess, R.N., Wittenberg College; vice-chairman—Miss Mary L. Earhart, R.N., Denison University; secretary-treasurer—Mrs. Dorothy A. Struhe, R.N., Miami University.

Miss Raidi Poole, R.N., chairman, College Nursing Committee of the National Organization of Public Health Nurses, gave a speech at the meeting.

The Ohio Section will hold the twenty-sixth annual meeting as guests of Kent State University at Kent, Ohio, in 1950.

The annual meeting of the Pacific Coast Section will be held at Claremont Colleges, Pomona, California, during the Thanksgiving recess, 1949. The Executive Committee has planned several panel discussions for the two-day meeting.

Antibiotics in the Treatment of Infections*

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This brief discussion of antibiotic therapy will be limited to a few important aspects which are affected by newer developments and changing trends. Progress in this field has taken place at an unusually rapid rate. We must evaluate it frequently in order to clarify the real contributions to concepts and methods which apply to the problems of our patients.

Antibiotic agents, especially penicillin, have come to be used universally. Dramatic therapeutic benefit is observed so regularly when conditions are appropriate as to be commonplace. One trend is a tendency to expect too much. A little reflection will at once reveal that routine programs cannot have a place in antibiotic therapy. So many factors modify the approach to the problem of infection that careful evaluation of each patient is of even greater importance than before the introduction of active antibacterial substances. Fortunately, the ultimate recovery of most patients is not dependent upon the exactness of specific treatment. However, other patients are encountered whose survival requires skillful application of the principles which are fundamental to the success of antibiotic therapy.

Penicillin

Penicillin is the antibiotic agent of most general importance at present. The story of its development and unparalleled success in the control of infections due to many gram-positive and some gram-negative organisms is well known. The evidence indicates that its effectiveness depends upon the maintenance of antibacterial concentrations in the tissues. These are presumably reflected by the level in the blood. Penicillin has been administered usually in the form of a soluble salt of sodium, potassium or calcium penicillin G in aqueous solution. With these preparations, effective levels can be maintained if suitable amounts are given by frequent intramuscular or by continuous intramuscular or intravenous injections. These methods have demonstrated their reliability. With the present state of knowledge, one of them probably should be used when adequate penicillin therapy is crucial for the control of life-threatening infections. The salts of penicillin are now provided in crystalline form. It is stable at room temperature. The crystalline form is less irritating when given intramuscularly than the older preparations of amorphous penicillin. Penicillin is still measured in terms of units because of popular experience with this expression. It may be estimated accurately by weight.

The discomfort to the patient and the general inconvenience of frequently repeated intramuscular injections with the soluble salt are real obstacles. A search for other satisfactory methods of administration was instituted early. Penicillin is inactivated in the stomach to a large extent but some absorption will occur from the gastro-intestinal tract if large doses are administered at intervals of 2 to 3 hours. Oral doses of approximately five times those given intramuscularly will result in a similar blood level in most individuals if the stomach is empty when penicillin is taken. There is considerable individual variation and the oral method of administration cannot be depended upon with assurance. It is most often justified in the treatment of young children and in others with infections which are highly susceptible.

The excretion of penicillin through the kidney by way of the tubules accounts for its rapid disappearance. Methods to interfere with this mechanism have been developed. Although several are partially successful, the simultaneous oral administration of caronamide (4' carboxyphenylmethanesulfonanilide) appears to be the most efficient and to have the fewest drawbacks of those at present available.[1,2] This drug when present in the blood in concentrations of 20 to 40 mg. per 100 cc. of plasma competes with penicillin for excretion by the kidney tubules. It will result in increasing the concentration of penicillin in the blood by from 3 to 10 times. A dose of 3 to 4 grams by mouth every 4 hours will be required in average individuals and somewhat less for those over 60. Harmful effects, except for an occasional reaction with fever and skin eruption, have not been observed. Caronamide would seem to have a place where levels of penicillin are required which are too high to be attained readily with ordinary means.

Methods have been sought which slow the absorption of penicillin after intramuscular injection. The first success in this direction came with the preparation containing the soluble salt of crystalline penicillin G in peanut oil and 4.8 per cent bleached beeswax (the Romansky formula). An injection of 300,000 units in 1.0 cc. will result in the persistence of a measurable concentration in the blood for 24 hours in the majority of patients. This preparation was widely used and constituted a significant advance. Its drawbacks consisted of an increasing tendency to local and systemic reactions, certain difficulties in administration, and uncertainty of effect after twelve hours. During the past year other outstanding advances have been made in the development of preparations which result in prolonged therapeutic concentrations after a single injection. The newer products have been made possible by the combination of procaine with penicillin to form an insoluble compound of crystalline procaine penicillin G. After injection intramuscularly

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the compound breaks down to liberate penicillin slowly. To facilitate administration procaine penicillin has been incorporated in sesame oil, or with a stabilizing agent (sodium carboxymethylcellulose) for aqueous suspension and in peanut or sesame oil jelled with 2 per cent aluminum monostearate. None of these to date have resulted in reactions other than those occasionally due to penicillin itself. They can be stored indefinitely at room temperature, are easy to administer and do not require absolutely dry glassware. Each of these preparations will maintain a blood level of 0.03 units or more per cubic centimeter for twenty-four hours or longer in nearly all patients after a single intramuscular injection of 300,000 units. That in oil with aluminum monostearate will persist from 96 to 120 hours at concentrations of .03 to .06 and more in most patients. The levels are somewhat higher during the first one to twelve hours, between 0.1 and 1.0 units in different patients and with different preparations, but tend to remain low throughout.[3,4,5] The peaks of concentration which are so conspicuous following the administration of the soluble salts do not appear. The development of these preparations of crystalline procaine penicillin is forward progress of practical importance. Many of the earlier drawbacks of penicillin therapy have been reduced. Experience under well controlled conditions has demonstrated that the use of this form of administration by widely spaced injections is effective for most infections which are ordinarily responsive to penicillin. This development has created a new trend and most patients are now being treated in this way. Unfortunately, there is a tendency to place too much reliance on this method of therapy. The great value of the newer methods could be overbalanced by harm if carelessness should develop as the result of simplicity in available modes of therapy.

A consideration of fundamental principles seems to demonstrate the direction which rational penicillin therapy should take. Many uncomplicated infections due to highly susceptible organisms are very responsive to treatment with penicillin. These include pneumococcic pneumonia, streptococcic pharyngitis, cellulitis, and acute gonorrhea. It has been shown that infections of this type are responsive to low, even erratic, blood levels of the agent. Success can be expected when soluble penicillin is used in doses and at intervals which may fail to maintain measurable amounts in the blood for more than half the interval between injections. With these infections the use of the oral route may be justified. Similarly, reliance may be placed on widely spaced injections of a slowly absorbed preparation of procaine penicillin in the treatment of these highly susceptible infections. On the other hand, the potentialities of many other infections indicate a different approach. Staphylococcic infections, as an example, with the tendency to tissue destruction and slow healing which these present, and the frequent occurrence of strains of the organism which are relatively resistant to penicillin, do not always respond readily. Here the maintenance of a therapeutically active blood level for the particular strain encountered is essential and must be controlled by frequent intramuscular injections. Similarly, the site of infection, even with very susceptible organisms such as the pneumococcus and streptococcus may indicate an unfavorable prognosis unless the optimum therapeutic concentration of penicillin is maintained. Meningitis, cavernous sinus thrombosis, subacute bacterial endocarditis, and actinomycosis are examples. The relative importance of the high peak level which follows the intermittent intramuscular injection of a soluble salt to that of the unvarying lower level obtained by the use of continuous infusion or a slowly absorbed repository product has not been established. There are theoretic considerations which favor the former.[6] There is reason to believe that higher maximum levels result in better diffusion into tissues and across serous membranes. This may be particularly significant in the treatment of meningitis due to gram-positive organisms where it seems likely that the use of doses of penicillin of a magnitude of 8 to 12 million units a day may obviate the need for its intraspinal injection and provide better results than heretofore obtained. Infections which have been considered resistant to penicillin are coming within its range with the trend toward the use of larger doses, or with the enhancement effect of caronamide, and the resulting very high blood levels. Of these, lung abscesses, peritonitis, and endocarditis due to relatively resistant organisms are examples. When the infection encountered is suspected of being relatively resistant, it seems reasonable to use treatment which accomplishes high peak and continuous minimal effective concentrations. Reduction in the number of injections required may be attained by administering a product of procaine penicillin once daily supplemented with two or three intramuscular injections of a soluble salt during the day. When circumstances permit, the accurate determination of the nature and penicillin susceptibility of the etiologic agent is always worthwhile.

Streptomycin

The antibiotic streptomycin has been shown to be a useful agent for the treatment of infections caused by many gram-negative organisms which are usually not responsive to penicillin. Activity has also been demonstrated for gram-positive bacteria as well, but streptomycin is usually inferior to penicillin in the treatment of infections caused by them. Occasionally it is effective when a penicillin-resistant strain of gram-positive organisms is encountered. The principles of therapy with streptomycin are much the same as for penicillin. It is excreted less rapidly so that intramuscular injections may be spaced at intervals of six hours or more. It is not absorbed when given by mouth. Methods for delaying absorption from the site of intramuscular injection or for delaying excretion by the kidney tubules have not been developed. Caronamide is not effective. Streptomycin is measured in terms of weight, expressed in micrograms or milligrams.

Streptomycin possesses features which render it a much less ideal antibiotic agent than penicillin. The

maximum tolerated dose is scarcely more than two or three times that required for the treatment of most infections. Prolonged administration results in toxic effects on the auditory apparatus in a significant proportion of patients. This may range from transient damage involving vestibular functions to permanent bilateral nerve deafness. Most bacteria have a tendency to develop resistance to streptomycin with great rapidity. Treatment is likely to be unsuccessful unless all infecting organisms are eliminated early. This is in contrast to penicillin, to which bacterial resistance after prolonged contact is rarely of practical importance.

The dramatic effectiveness of streptomycin in tularemia has been thoroughly demonstrated. It is also frequently effective in the treatment of infections due to gram-negative bacilli which have formerly proved fatal. These include meningitis and endocarditis due to A. aerogenes, E. coli, and many others. Streptomycin is more effective in the treatment of H. influenzae meningitis than the combination of sulfadiazine and specific antiserum. It does not penetrate in satisfactory amounts through the meninges so that intraspinal injections of 10 to 20 milligrams daily until the spinal fluid is sterile are dictated. Sepsis and penumonia due to gram-negative organisms may be treated successfully with streptomycin. When any of these life-threatening infections are encountered it seems justified to disregard the dangers of toxic effects and to administer the agent in amounts up to 4 grams a day by the intramuscular route for as long as necessary.

Streptomycin is a very efficient agent for the treatment of acute urinary tract infections due to gram-negative organisms which are not responsive or have become resistant to other methods of therapy. The tendency to the development of resistance by these organisms is demonstrated rapidly in the urinary tract, however, and recurrence usually occurs if structural defects or any element of obstruction is present. For urinary tract infections a dosage of about 2 grams of streptomycin a day for five to seven days will accomplish the maximum therapeutic result without the danger of toxic effects. A second course of therapy, if necessary, will usually encounter a resistant strain of organisms.

Although streptomycin has a place in the treatment of tuberculosis it must be considered only temporarily inhibitive to the organism and thus, ancillary to the general management.[7] It is most effective in the therapy of acute exudative pulmonary and bronchial lesions. For the latter it has proved valuable prior to pulmonary resection which could not be performed in the presence of tuberculosis affecting major bronchi. Streptomycin has a significant inhibitory effect on miliary and meningeal tuberculosis but as the period of observation extends, the number of patients who have remained well after apparent recovery from this type of infection becomes fewer. This antibiotic is, nevertheless, pointing the way toward the development of effective methods of specific therapy in tuberculosis.

Other Antibiotic Agents

Dozens of other antibiotic agents have been discovered which possess activity against various organisms in vitro. Only a few of them are applicable to the treatment of infections. Tyrothricin was the first to be accepted for clinical use. It was isolated by Dubos in 1939 from a soil micro-organism, Bacillus brevis.[8] Tyrothricin possesses marked antibacterial activity against most gram-positive organisms but is inactivated in the tissues and is toxic when given parenterally. In concentrations of 0.5 to 1 mg. per cc. of aqueous suspension or per gram of water-soluble cream it is highly effective in the local treatment of chronically infected ulcers and wounds. Penicillin and streptomycin were the next antibiotics to be accepted. The success of these stimulated extensive programs directed toward the discovery of new agents with greater effectiveness. Of those discovered, at least five warrant comment because they are of established value already or have promise sufficient to deserve continued investigation. Subtilin and Bacitracin are derived from strains of Bacillus subtilis and are effective against a variety of gram-positive organisms. Subtilin has activity against the tubercle bacillus and has been successful in the treatment of experimental tuberculous infections. It has not received sufficient clinical trial. Bacitracin is now accepted for local use in the management of pyogenic infections. Concentrations of 100 to 500 units per cc. are recommended. Early trials by parenteral injection resulted in renal toxicity. If this property can be eliminated as purified materials become available, Bacitracin may prove of great value for the treatment of systemic infections. It also shows promise in the therapy of gas gangrene. Polymyxin derived from Bacillus polymyxa in the United States and Aerosporin from Bacillus aerosporin in England are identical or closely related. They may have value in the therapy of infections due to gram-negative organisms. Early clinical trials have been disappointing.

Penicillin possesses activity against the psittacosis-lymphogranuloma group of viruses, or rickettsiae as these are now being classified. Recently two other agents have been discovered which have a wide range of effectiveness in experimental infections with the entire group of rickettsiae and against many gram-positive and gram-negative bacteria as well. Further, each is active when administered by the oral route, a property unique among antibiotics and suggesting the approach of a new era in the specific treatment of infections. Chloromycetin was isolated from a soil Streptomyces obtained form Venezuela by Burkholder of Yale.[9] Clinical trials have demonstrated remarkable effectiveness in the treatment of epidemic typhus, scrub typhus, and Rocky Mountain spotted fever.[10] Chloromycetin seems also to have application in the treatment of typhoid fever.[11]

Aureomycin was discovered by Duggar from Streptomyces aureofaciens isolated from soil in Wisconsin. It has now been accepted and is commercially available. It possesses a range of activity very similar to chloromycetin.[12] Therapeutic concentrations can be maintained

in the blood by the oral administration of 0.5 to 1.0 gram every four to six hours in adults. The only symptoms of toxicity noted have been nausea, vomiting, and loose stools in occasional patients. Finland has shown that aureomycin has a place in the therapy of several resistant bacterial infections among which are gonorrhea, pneumococcic pneumonia, salmonella infections and typhoid fever.[13] Spink has demonstrated a remarkable effectiveness in the treatment of severe Brucella melitensis infections.[14] There is evidence that aureomycin has application in the treatment of atypical pneumonia, a disease of unknown etiology but for which a virus cause is suspected. None of the true viruses, including influenza and poliomyelitis, have been affected by either chloromycetin or aureomycin. Experience now suggests that aureomycin is not effective in the treatment of infectious mononucleosis.

Summary

This discussion has been concerned with certain aspects of antibiotic therapy which are of practical importance in the light of present knowledge. The development and the benefit of methods of penicillin administration which provide prolonged concentrations in the blood after single intramuscular injections have been considered. It has been emphasized that complete dependence must not be placed on any routine method of therapy. The place of streptomycin in the treatment of infections is briefly summarized.

The discovery of chloromycetin and aureomycin has extended the range of specific therapy to rickettsial and some formerly resistant bacterial infections. The potentialities of these agents are only now being explored. It is likely that a new era in antibiotic therapy is beginning.

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The JOURNAL LANCET

Official Journal of the American College Health Association, Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology

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Editorial

SINCE HIPPOCRATES

Again, the Annual Minneapolis Academy of Medicine issue of the Journal Lancet goes to press. It almost went without the sigil of the incoming president, but our newest wonder-drug, Aureomyecin, has reduced the fever and brought the wonderful associated Cinderella-like flights of fancy back to the level of the pumpkin, and somewhat hollow.

In the board of convalescence, however, I picked up a book which came from the library of the late Dr. Thomas Roberts and wrote out my fever on the rediscovery of the works of Hippocrates. The volume is yellow with age and the title page carries an inscription of some local interest, "Merry Christmas, '01, Dr. James E. Moore." The translation was sponsored by the Sydenham Society and edited by Dr. Francis Adams, surgeon. It is a scholastic masterpiece and one wonders in the present days with the demephis of classes, studies if modern scholars could redraw the fine shades of meaning noted in the texts and footnotes.

Medical writings and records are a peculiar form of literature, and the flux and changing thought as to the nature of diseases and treatment, diagnosis and cognosis, could be a science in itself. Galen's commentaries on the work of Hippocrates are in marked contrast to Dr. Adams' and to the modern practitioner the comments of Dr. Adams are definitely dated by the advances since that time. One is appalled by the mass of information on record and it should humble one's attitude before attempting to add to the pile. In modern literature, many things are rediscovered; very little really new is added.

The Minneapolis Academy of Medicine has had a very successful season under the able guidance of retiring president, Dr. Thomas J. Kinsella. He has set high standards which are a challenge to those who are to follow.

—Cyrus Owen Hansen

HOW THE MINNEAPOLIS WAR MEMORIAL BLOOD BANK CAN SERVE HOSPITALS, PHYSICIANS AND THE PUBLIC

Ever since William Harvey first announced his observations on the circulation of blood in 1616, and Richard Lower, the English physiologist, performed his first successful transfusion on animals in 1665, and Jean Baptiste Denis in 1667 transfused the blood of a lamb into a young man, the concept of blood as a therapeutic agent has persisted through the years.

It was not, however, until Landsteiner and his students, Decastello and Sturli, at the turn of the century

*Read at the Upper Midwest Hospital Conference, May 28, 1949.

discovered the four blood groups, that blood transfusions became safe and practicable. In recent years blood therapy has become increasingly important in medical practice.

With the improvement of methods for blood storage, many hospitals have found it to their advantage to establish blood banks. In order to have all types of blood more readily available to patients, however, a new forward step has been taken by some communities. Central blood banks have been established in many cities of this country and most of these have proven to be so successful that there appears to be a definite trend toward this cooperative venture in many of the larger cities. Any city the size of Minneapolis would not be meeting its responsibility to the people of the community if there were not made available a large reserve of blood equal to the needs of the sick and injured in normal times and in times of disaster. Some of the most successful of such banks have been established in Seattle, San Francisco, Denver, New York, Miami, Phoenix, Dallas, Fort Worth, Milwaukee, and in some other cities.

The need for centralization of blood banking facilities was recognized early in Minneapolis. In 1940 the Hennepin County Medical Society began to discuss the possibilities of establishing a central community blood bank in Minneapolis. Fraternal orders and labor groups in Hennepin County became concerned, and the Junior Chamber of Commerce sought ways and means of improving community blood transfusion programs and supported the idea as one of their community projects. By consistent, untiring effort, the project advanced through the various organizational phases. A Board of Directors, consisting of hospital administrators, physicians, county representatives of business, labor, churches, Jaycees, University, State Health Department and other organizations, was organized. The work was largely directed by an executive committee elected by the Board. A campaign for funds was successfully conducted and a beautiful building was purchased at 1914 LaSalle Avenue, a location in rather close proximity to the hospitals in Minneapolis. This building was remodeled and eqiupped, and on Armistice Day, November 11, 1948, it was dedicated as a memorial to those servicemen of World War II who did not return. I think it stands as a great tribute to the vision and deep insight of the planners of this worthy memorial. The Minneapolis War Memorial Blood Bank began drawing blood on December 1, 1948.

The Minneapolis War Memorial Blood Bank is set up on a community level and is incorporated as an independently-operating, policy-making, non-profit institution. As a general proposition the bank does not use professional donors. Blood is neither bought nor sold and publicity is resorted to as little as possible. This is on the grounds that a promiscuous appeal to the public for blood donors will not produce satisfactory results. Instead, the Minneapolis War Memorial Blood Bank concentrates on having the blood replaced by relatives and friends of the recipient, which results in a steady supply of blood. This supply is further augmented by donor clubs, group insurance and other methods. Thus, by working together, doctors, hospitals and the blood bank staff succeed in obtaining a sufficient supply of blood to insure the maximum welfare of a patient who needs a transfusion, and at the same time easing the financial burden on the family. The success of this bank will always depend upon the complete cooperation among the hospitals, doctors and patients.

I think it is important to emphasize the fundamental principle that the centralization of all blood sources and laboratory procedures is the first essential toward a well functioning blood bank. A blood bank having the largest supply of blood and reagents, and well qualified technical staff especially trained in serology and immunology, and directed by a full time person, is far better equipped to perform satisfactory service than are individual hospital laboratories.

How, then, may The Minneapolis War Memorial Blood Bank best serve hospitals, physicians, and the public? It is quite obvious that the first and foremost objective of any blood bank is to have on hand sufficient blood of all types to enable the blood bank to honor without delay the requisition of any physician at any time. The physician should be able to write blood requisitions as freely as he writes prescriptions, and with the same confidence that his blood requisitions will be as readily filled.

This objective is met by The Minneapolis War Memorial Blood Bank in several ways. First of all, the bank has not only been able to maintain a supply of blood in its own refrigerators, but has been able to stock the refrigerators of the hospitals it serves with a constant supply of the various types of blood. This is accomplished largely through its program of donor replacement. By requiring that a friend or relative of each patient replace the blood used by him, unit for unit without regard to type, the blood bank has been able to maintain a constant supply of blood and plasma equal to the needs of the sick and injured within the area served by the bank, and also maintain a comfortable reserve for emergencies. This replacement of blood by relatives and friends of the recipient brings a steady supply of blood into the bank.

It should be pointed out that there is no charge made for blood received by any patient. There is, however, a modest service fee of $6.00 per unit of blood or plasma, which covers the cost of typing, determination of Rh, serology tests and other services. In cases where the service fee cannot be paid by the patient, the cost is taken care of by the blood bank. No request for blood or blood bank service is ever refused because the patient is unable to pay the modest laboratory fee. In order to encourage the patient to have his friends or relatives replace the blood in the bank, there is, besides the laboratory fee, a deposit charged to the patient's bill for each unit drawn until his donors replace the blood to the bank, at which time the deposit is refunded in full to the patient. It is essential that the patient arrange for replacements rather than forfeit this penalty deposit.

There is, however, a gap which always exists in the blood bank between the actual output of blood and re-

placements. This is so because of the very nature of a blood bank. Since blood is perishable and can be kept in storage only a short time, it is necessary to collect enough blood in excess of what is actually used to replace blood that becomes outdated, and also to back up abnormally large withdrawals from the bank of any one particular type of blood. This gap is taken care of in the Minneapolis War Memorial Blood Bank by means of donor group plans, group insurance, and other methods. Indeed, it was the Post Office Group and the Jaycees who initiated the setting up of "pools" in the blood bank to insure their membership of blood for transfusions with the least inconvenience to the group. Under this plan members of these and other organizations deposit blood in the bank and build up a credit account for the group. This is in the nature of an insurance premium. As long as the group continues to send its allotted number of blood donors, every member of the group is insured—that is, the credit held at the blood bank in the name of the group will be applied to any members of the group who may later need transfusions. If it is the wish of the group, its credits may also be transferred to those in the immediate families of its members.

Although an adequate supply of blood must always be available in a blood bank, it is, nevertheless, basically unsound to drain the community of more blood than is absolutely necessary. In the Minneapolis War Memorial Blood Bank no blood is ever wasted, for when blood becomes outdated, the plasma is drawn off, treated by ultra violet irradiation, and is made ready for patients where such therapy is indicated. The outdated cells which remain are used for extraction of the new Rh hapten.

Another invaluable service of the Minneapolis War Memorial Blood Bank to hospitals, physicians, and the public is the standardization of techniques and procedures by the employment of well trained specialists in the community blood bank. It is only reasonable to expect that with such an advantage fewer errors will result in technical procedures which, in turn, will mean better treatment for the patient.

Furthermore, this blood bank fosters and promotes the exchange of ideas and material and the dissemination of information relating to blood banking and its technical methodology by education, publicity and research. Here we have a central blood bank and laboratory to which technicians from laboratories throughout the state and in adjoining states can come and receive refresher training in proved techniques and procedures of blood bank work. This service is cordially offered to laboratory personnel in hospitals of this region.

With the expanding roll of blood transfusions in medical practice, the problem of obtaining whole blood for transfusion purposes in small rural communities becomes one of increasing importance. The Minneapolis War Memorial Blood Bank can be of help to hospitals located in smaller communities in Minnesota and nearby states. This may be done in one of three ways.

(1) *By setting up satellite blood banks.* This sort of bank would be set up in a community in which there are two or more hospitals. Such a branch bank could function on the same basis as the blood bank in Minneapolis, and would be set up as an independently-operating and policy-making non-profit institution in close proximity to the hospitals in the community. As is the practice in the bank here, blood could be kept on hand at all times in all hospitals served by these banks. The Minneapolis War Memorial Blood Bank would be willing to aid in establishing such subsidiary banks in communities of this region should we be invited to do so and if we would have the full backing of the medical society and civic groups within the community. Such a satellite bank would be sustained and enhanced by the mother bank in times of emergency when abnormally large amounts of blood of a certain type would be needed at any one time. It is also conceivable that the Minneapolis bank might have occasion to call upon the satellite bank in the exchange of blood of different types, and thus maintain a more balanced distribution of the bloods that are needed in the communities. It must be remembered that the larger the pool of blood from which to draw, the more adequate will be the blood supply for the people we serve. By pooling our blood resources, our techniques and our procurement efforts, we will become ever more efficient and adequate.

(2) *By Supplementary Service.* Another way in which the Minneapolis War Memorial Blood Bank may be of service to hospitals in outlying communities where blood banks are already established is on a supplementary basis. It is important to know that the central blood bank located here can cooperate both in normal times and in times of disaster with existing hospital blood banks in outlying communities. Perhaps the most recent instance of such cooperation in disaster was in Texas City, in which the William Buchanan Blood Bank, located in Dallas, because it was organized and functioning, was able to supply all the blood necessary to the disaster area. This blood bank collected the blood, did the serology, typing and Rh testing, and sent the blood, together with pilot tube and transfusion set, to the John Sealy Memorial Hospital in Galveston, where the cross-matching and transfusions were done.

A central community blood bank such as ours must, of course, be prepared to expand quickly and supply blood in times of disaster; but during normal times there are often emergencies which call for blood in such amounts as to tax the capacity of hospital blood banks beyond their ability to supply the blood. It is the earnest desire of the board and administration of the Minneapolis War Memorial Blood Bank to assist in such emergencies and strengthen hospital blood banks in smaller communities.

(3) *By assisting to establish "walking blood banks".* A third type of service is offered by the Minneapolis War Memorial Blood Bank to those small rural communities which, because of the infrequent calls for blood, have no blood bank in their hospitals. In such communities blood cannot be maintained in a constant, adequate supply in a local blood bank. Nevertheless, the occasional need for blood may be acute.

We believe there is a practical solution to this problem and that the bank in Minneapolis can render a definite community service in helping to solve it. I refer to a "walking blood bank" for these communities, wherein each adult person in the community would have his blood typed, Rh tested, and a serology test done.

The plan is rather simple. It would, however, require a bit of organizing to set it up in the community. First of all, there must be a local sponsoring group such as the Junior Chamber of Commerce, the American Legion Post, or some other community group. This group would carefully organize the community and make plans for obtaining specimens for typing, Rh determination, and serology tests. Although the details would be worked out by the local sponsoring group, the blood bank could, nevertheless, assist in an advisory capacity and could actually send personnel to the community according to previous arrangements to draw blood specimens, which could be brought back to the laboratories of the blood bank for blood grouping, Rh determination, and serology tests.

The benefits of such a program would far outweigh the time and cost, which cost would be nominal and could be defrayed by the local sponsoring group or hospital.

The security which such a program would provide against possible blood needs is invaluable. Individuals of known blood group and Rh type in the community could be called upon as donors when blood is needed for transfusions. Furthermore, in such a program the community would be to a large degree independent of any outside agency. In times of emergencies or disasters, however, they would still have the opportunity of calling on the Minneapolis War Memorial Blood Bank for additional help.

Another service which can best be furnished by large central community blood banks and is now being offered by the Minneapolis War Memorial Blood Bank is that of Rh consultancy, as well as consultancy service in genetic studies in families where Rh and other blood factors are concerned, non-paternity service, and other special problems. Obstetricians, pediatricians, and doctors in general practice may want to be apprised of this service.

The Minneapolis War Memorial Blood Bank will shortly be prepared to offer still another service to laboratories in this area. There will be available for distribution soon, high quality anti-A and anti-B blood grouping sera and Rh typing sera. You may be interested to know that the funds obtained from consultancy service and the sale of antisera will be turned directly into the research department of this blood bank, in which will be conducted studies of problems connected with blood groups, Rh, Hr, and other hereditary factors in the blood. Thus will be created a beneficent cycle which will function for the help and blessing of the people we serve.

G. ALBIN MATSON, Ph.D.,
Director, Minneapolis War
Memorial Blood Bank, Inc.

News Items

South Dakota

The 68th annual meeting of the South Dakota State Medical Association was held the end of May at Yankton. Dr. William H. Saxton, Huron, was chosen president to succeed Dr. John L. Calene, Aberdeen. Dr. C. E. Robbins has taken the position of President elect, while Dr. L. J. Pankow, Sioux Falls, was elected vice president, and Dr. H. Russell Brown, Watertown, was named speaker of the house.

Dr. F. W. Freyberg became the first Mitchell man to become a member of the South Dakota State Medical Association Fifty-Year Club. He was presented the award at the annual state medical meeting. Dr. William D. Farrell, Aberdeen, was also presented an award by the state association for his fifty years of service in medicine.

Dr. R. L. Ferguson, professor of pathology of the University of South Dakota Medical School, has been awarded membership in the American Society for Experimental Pathology. Election to membership is based on research, training and general ability.

Dr. A. J. Miller of Aberdeen assumed duties as resident pathologist at St. Luke's hospital in July.

Dr. C. F. Gutch of the Pierre Clinic left this month for training in internal medicine at the U. S. Veteran's Administration Hospital in Lincoln, Nebraska.

North Dakota

The North Dakota State Medical Association formed this year the Fifty-Year Club. The new group met for the first time in Minot at the close of the state medical convention.

One woman, Dr. Fannie Dunn Quain, Bismarck, retired, who received her degree in 1898, is included in the group of 19 eligible members.

Oldest doctor, in point of service, is Dr. F. N. Burrows, Bathgate, who received his degree in 1885. Others in the group are Drs. W. H. Bodenstab, Bismarck, 1893; R. D. Campbell, Grand Forks, 1893; J. E. Countryman, Grafton, now of Arch Cape, Oregon, 1893; A. B. Field, Forest River, 1891; W. A. Gerrish, Jamestown, 1896; A. T. Horsman, Devils Lake, 1890; C. S. Jones, Williston, 1896; J. G. Lamont, Grafton, 1895; A. W. MacDonald, Valley City, 1897; O. A. Maercklein, Mott, 1897; E. P. Quain, formerly of Bismarck and now at Eugene, Oregon, 1898; N. O. Ramstad, Bismarck, 1899; Olaf Sand, Fargo, 1897; J. F. Timm, Makoti, 1895; G. M. Williamson, Grand Forks, 1895; J. W. Bowen, Dickinson, 1898; W. F. Sihler, Devils Lake, 1898.

Dr. E. P. Quain, Eugene; Dr. Bodenstab and Dr. Fannie Dunn Quain of Bismarck, and Dr. Sihler of Devils Lake were elected to honorary membership in the state association by the house of delegates.

Dr. L. J. Hill has left Bottineau for St. Louis University where he will complete his remaining two year study toward certification as a specialist in orthopedic surgery.

Dr. Roy Eldred of the University of Minnesota and formerly a member of the Cayuna Range Clinic at Crosby-Ironton, Minnesota, is now associated with Dr. Malvey in Bottineau.

Dr. L. J. Alger, oculist of Grand Forks, North Dakota, has recently purchased a Beechcraft Bonanza Airplane. Dr. Alger has been flying for the past seven years and finds flying his own plane a time saver in attending the monthly meetings of the Minneapolis Academy of Ophthalmology and Otolaryngology.

Dr. and Mrs. H. Milton Berg of Bismarck have recently returned home after a three month's tour of European medical centers. Dr. Berg is the roentgenologist for the Quain-Ramstad clinic in Bismarck.

Dr. Richard L. Varco of the University of Minnesota was the speaker for the monthly meeting of the Stutsman County Medical Society which met in Jamestown.

Dr. Graham A. Kernwein, Dr. A. L. Cameron and Dr. Paul J. Breslich of Minot attended the American Medical Association meeting this past month in Atlantic City. At the meeting of the American Association for the Surgery of Trauma which met the week prior to the A.M.A. meeting, Dr. Graham delivered an address, "Surgery of the Spine."

The following doctors have joined the North Dakota State Medical Association: W. A. Craychee, Mandan; Phillip Blumenthal, Mandan; C. A. Bush, Beach; W. R. Enders, Hazen; R. C. Turner, Grand Forks; William C. Hurley, Minot; and Lowell E. Boyum, Harvey.

The Cass County District Medical Society and the Richland County Medical Society have merged. The society is known as the First District Medical Society and has the following officers: Dr. C. O. Heilman, Fargo, president, and Dr. J. H. Bond, Fargo, secretary.

Dr. H. B. Huntley, a Cass county physician for years, was honored by the residents of Kindred and Leonard at an out door service. Dr. Huntley has served these communities for forty years.

Dr. James D. Cardy of Alberta, Canada, a specialist in pathology will join the North Dakota Medical staff on July 1. In addition to teaching at the school of medicine, Dr. Cardy will have the duties of extending pathological services to North Dakota Hospitals, developing a modern laboratory for tissue diagnosis and holding clinics to aid in early detection of pathological diseases, especially cancer.

Minnesota

Dr. F. W. Hoffbauer of the University of Minnesota addressed the Range Medical Society at their monthly meeting in May.

The center for continuation study presented a three day cancer course for physicians in Minnesota and North Dakota. The guest speakers were Dr. Lauren Ackerman of the department of surgery, Washington University, St. Louis, and Dr. David P. Anderson of the Austin Clinic.

Dr. B. O. Mork, Jr., has left the Worthington Clinic after 17 years as a staff member to enter the public health service.

Dr. Edgar V. Allen of Rochester was elected vice president of the American Heart Association at the association's twenty-fifth annual meeting just concluded in Atlantic City. His term of office will be for the 1950-51 term.

A $500 scholarship to be awarded annually to a Concordia senior who plans to become a doctor has been provided by Dr. B. T. Bottolfson, Moorhead physician for over 30 years. It will be known as the Emma Norbryhn scholarship. This year's award goes to Miles Efteland of Erskine, Minnesota. He will enter either Northwestern or Minnesota Medical Schools in September.

Outstanding work in the clinical fields of medicine and surgery at the University of Minnesota Medical School won John K. Meinert, 22, senior from Winona, the 1949 Southern Minnesota Medical Association award. Dean Harold S. Diehl of the University Medical Sciences presented the top honor to Meinert.

Dr. Robert A. Stoy is now associated with Dr. R. V. Fait and Dr. D. L. Johnson in the practice of medicine in Little Falls. Dr. Stoy has recently been at LaFayette, Indiana.

A Duluth pathologist, Dr. Arthur H. Wells, was elected to the presidency of the Minnesota Society of Clinical Pathologists at its meeting in St. Paul. The session was held in conjunction with a testimonial dinner for Dr. E. T. Bell, professor of pathology, University of Minnesota School of Medicine. Dr. Wells is in charge of the laboratory department at St. Luke's hospital.

Dr. Howard K. Gray, head of a section in surgery at the Mayo Clinic, received a doctor of science degree at the Lafayette college commencement exercises.

Seven new members have been admitted to the medical staff of Glenwood Hills Hospital, it was announced by Mrs. Stanley V. Hodge, chairman of the board of trustees. All the new staff members have been certified to practice by the American Board of Psychiatry and Neurology. Their appointment brings the hospitals' medical staff to nineteen members. New members are Drs. Eric Kent Clarke, George M. Cowan, Stanley G. Law, Zondal R. Miller, Leonard A. Titrud, David S. Thorsen and Martin Sukov.

Obituaries

Walter C. Popp, M.D., Rochester, Minnesota, died June 4 of a heart attack. He was 47 years old.

Dr. Popp was educated at St. Vincent College and the University of Pittsburgh where he received his doctor's degree in 1929. He entered the Mayo foundation in 1930 and remained on the staff as an associate professor until his death.

Benjamin F. Swezey, M.D., 75, Buffalo, Minnesota, died June 2 in Minneapolis.

The pioneer physician was born in Nebraska in 1873 and took his medical training in Iowa. He graduated in 1903 from the College of Physicians and Surgeons, Keokuk, Iowa, which since has been combined into the State Medical College of Iowa. He then practiced with his brother in Iowa until he came to Minnesota in 1906.

Dr. Swezey practiced in Nassau, Lac qui Parle county, and in Bellingham until 1917 when he moved to Buffalo. There he remained in active practice until his death.

Ignatius J. Murphy, M.D., St. Paul radiologist died June 2 at 64.

A leader in public health, Dr. Murphy was director of the Murphy laboratories. He served as a consultant in roentgenology to doctors and hospitals throughout the Northwest and specialized in the treatment of cancer.

He was former health officer of St. Louis county, executive secretary of the Minnesota Public Health Association, president of the Minnesota Sanitary Conference and former editor of the Minnesota Health Journal.

He held memberships in the Hennepin County Medical Society, Radiological Society of North America, Minnesota Pathological Society and American Academy of Physicians.

James S. Gilfillan, M.D., 81, of St. Paul, died June 13. Until his retirement in 1938, Dr. Gilfillan practiced internal medicine in St. Paul and taught at the University of Minnesota medical school.

Lyle C. Bacon, M.D., St. Paul physician for 50 years, died June 4 at the age of 83. Dr. Bacon was professor of obstetrics and gynecology at Hamline Medical school until it merged with the University of Minnesota.

John G. Ericson, M.D., 81, died in Minneapolis in May. Born in Sweden, he lived in Minneapolis for 66 years. An eye, ear, nose and throat specialist, Dr. Ericson was associated in practice with his son at the time of his death.

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The JOURNAL LANCET

Minneapolis, Minnesota
August, 1949

Vol. LXIX, No. 8
New Series

Stromal Endometriosis

William C. Keettel, M.D.,* James G. Lee, M.D.,* John H. Randall, M.D.*

Iowa City, Iowa

The entity known as stromal endometriosis or "interstitial endometrioma" was first described by Casler[1] in 1930 in a woman in whom overgrowth of the endometrial stroma predominated to the point of strangling the glandular elements. Frank,[2] in 1932, described a similar case although he did not attempt to classify it other than as "fibromyosis". Present-day concepts of the entity were most completely formulated by Goodall[3] in 1937.

Goodall presented 14 cases of "interstitial endometriosis" in which stromal cells predominated to the exclusion of glandular elements. He pointed out that this is essentially a benign disease in which the interstitial stromal cells have grown vicariously beyond the normal bounds of the endometrium. In the majority of cases, benign penetration occurs, the extrauterine growth being a true lymphatic extension with the line of continuity from the parent growth well maintained. The tumor grows by displacement of normal structures after penetration of lymph channels.

Grossly, the uterine lesion may present one of several pictures. One of the earliest changes consists in moderate enlargement of the uterus due to thickening of the uterine wall. When sectioned in the fresh or unfixed state, the myometrium appears coarse, with multiple small rounded elevations. Under traction, these bodies stretch like rubber bands. Cut surfaces of fixed tissue show discretely outlined rounded, yellowish areas resembling brain tissue. Occasionally there are peculiar polypoid masses extending into the uterine cavity. The peritoneal lesions, if they occur, are demonstrated by small round masses that are yellowish on cut surface.

The microscopic features of stromal endometriosis are fairly constant and the chief difficulty in diagnosis is the relative infrequency of the disease. The endometrium is unaffected, but the myometrium is infiltrated with stromal cells, particularly along blood and lymphatic channels. This tissue consists entirely of stromal cells with occasional mitoses. Silver stains demonstrate the fibrils surrounding the cells in a circular or basket weave pattern like that in normally placed endometrial stroma. With hematoxin and eosin, the cells themselves are spindle-shaped or round and contain deeply stained vesicular nuclei.

Numerous endothelial lined vascular channels devoid of erythrocytes are observed. Many of them are partly, but never completely, filled with tongue-like extensions of stromal cells. In addition, many blood vessels with well defined walls are observed throughout the tissue.

In April, 1948, a patient with stromal endometriosis stimulated our interest in the condition. I. K., 48-3932, a 44-year-old gravida 5, para 5, entered the State University of Iowa Hospitals complaining of a bloated feeling, fatigue, and increasing constipation. The menstrual history was normal. There was slight ankle edema, three pound weight loss in the past six months, and poor appetite.

Physical examination revealed a thin patient in good physical condition. The abdomen was moderately distended with fluid and numerous nodular masses were felt throughout the lower quadrants. The liver edge was palpable and smooth. The cervix was displaced behind the symphysis. The uterus and adnexa could not be identified from a 12x9 cm. fixed hard culdesac mass. There was thickening in the left parametrium with en-

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croachment on the rectum; the right parametrium was fixed. Speculum examination showed a fungating mass protruding through the posterior vaginal fornix.

Laboratory findings were normal except for mild hypochromic anemia. The first vaginal smear was negative for abnormal cells, but a second showed suspicious cells. The chest was normal radiographically. The clinical impression was carcinoma of the ovary with abdominal carcinomatosis.

Biopsy of the vaginal lesion revealed endometriosis. (See Fig. 1.) Prior to receipt of this report, the patient had been referred to the Department of Radiology and had received 1,800 roentgens (in air) to the parametrium. Further studies were then instituted.



Fig. 1. Section of tissue which had penetrated through the posterior fornix of the vagina. Shows dilated glands surrounded by stroma. (Photomicrograph x 100.)

Barium enema showed an inconstant defect in the proximal rectum beyond which no barium passed. The roentgenologist diagnosed a pelvic mass exerting extrinsic pressure on the rectum. Proctoscopic examination revealed constriction of the rectum 2 inches (5.0 cm.) above the anal orifice, while a mass of friable granular tissue was seen 4 inches (10.0 cm.) above the orifice. Biopsy showed endometriosis beneath the rectal mucosa.

Exploratory laparotomy was performed twelve days after admission. On opening the abdomen, there was a moderate amount of free fluid and numerous peritoneal implants scattered over the visceral and parietal surfaces from the pelvis to the diaphragm. The omentum was studded with nodules. The uterus and adnexa were incorporated in a mass of dense adhesions and were not identified as such. Since it was felt that the tumor could not be removed, the abdomen was closed after several biopsies were taken. Diagnostic curettage produced a small amount of endometrium. The gross findings were consistent with the diagnosis of abdominal carcinomatosis. However, the histologic diagnoses were normal atrophic endometrium (curettage) and abdominal stromal endometriosis (Fig. 2). Despite the fact that no other therapy was given, the patient's postoperative convalescence was uneventful.

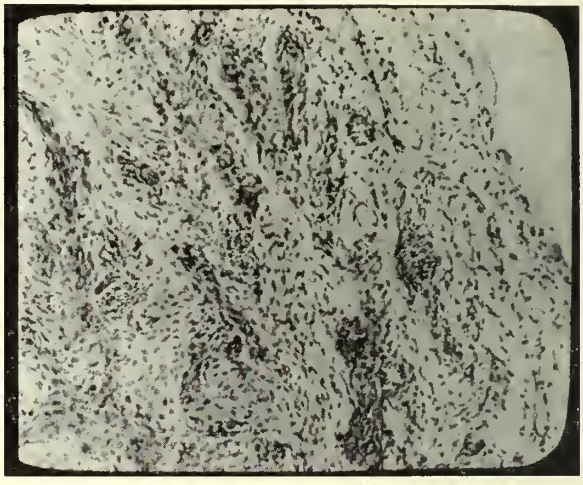


Fig. 2. Section of tissue taken from abdomen at time of laparotomy. Relatively normal appearing stromal tissue is seen and mesothelium is observed along the surface of the tissue. Note numerous blood vessels. (Photomicrograph x 100.)

Two and a half months after laparotomy, examination revealed the abdominal mass undiminished in size; the polypoid growths in the vagina were slightly smaller. The patient was feeling well and the symptoms were subsiding. She was seen again seven months after the first admission. There were no complaints, except amenorrhea of six months' duration. The abdominal masses were perhaps slightly smaller, but the pelvic organs were still fixed and the left parametrium infiltrated. The polypoid masses in the posterior vaginal fornix had completely disappeared, but there was slight residual scarring.

Since Goodall's publication of fourteen cases, there have been twelve additional cases reported by Robertson and co-workers,[4] Miller and Tennant,[5] DeCarle,[6] and others.[7] The majority of these reported patients were in the childbearing age, but four were postmenopausal. The principal symptoms mentioned were excessive bleeding and abdominal pain. In the majority of cases the pathologic process was confined to the uterus. However, in nine there was extra-uterine involvement. All but six of these patients were treated by hysterectomy. Five were irradiated because the involvement was so extensive.

Previous to Goodall's recognition of this entity, the microscopic diagnosis was most often fibromyoma with sarcomatous degeneration. Most of his early cases were subjected to laparotomy because of an abdominal mass thought to be a fibromyoma. Clinically, these patients did surprisingly well despite the histologic diagnosis and the extension of the growth beyond the confines of the uterus. Usually hysterectomy was the only treatment necessary; in several patients with marked extension, x-ray castration was employed with good results.

In hopes of finding other cases of stromal endometriosis, all patients' records with the diagnosis of sarcoma of the uterus were reviewed. In eleven instances where the patient was alive and well after two or more years,

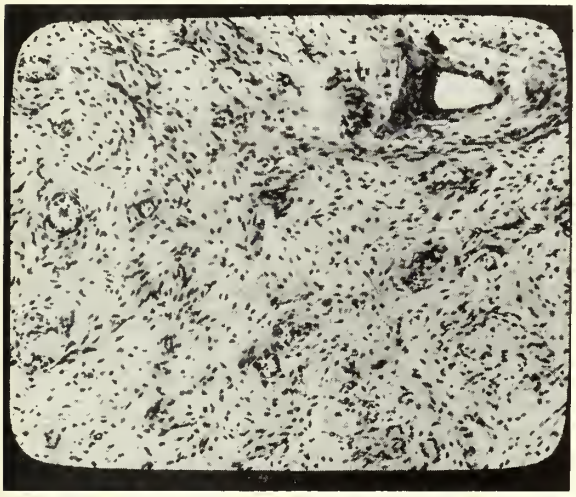


Fig. 3. Tissue obtained from same area as Fig. 2 which shows the only glandular structure observed in abdominal biopsy. (Photomicrograph x 200.)

the microscopic slides were reviewed. In none of these sections was there histologic evidence of stromal endometriosis. However, in light of more recent knowledge, many of them would not now be diagnosed as sarcoma.

There is some evidence that adenomyosis and stromal endometriosis may be variants of the same process and a suspicion that this entity and external glandular endometriosis may be related. However, the fact that stromal endometriosis has been reported after the menopause argues against any ovarian hormonal relationship.

This case was interesting because:

1. It brought this entity to the attention of the department.
2. The extent of the abdominal stromal endometriosis was greater than in other reported cases.
3. The finding of coexisting extra-uterine endometriosis in the vagina and rectum is unusual.
4. Despite the inoperable nature of the lesion, x-ray castration has brought symptomatic relief and regression of the vaginal lesion.
5. The question still remains unanswered as to whether the stromal or glandular elements, or both, responded to the castration dose of x-ray.

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MEDICAL SCHOOL SCHOLARSHIPS

A new program of scholarships, to start next fall, will be offered to undergraduate students in the school of medicine at the University of Minnesota by the Minnesota Medical Foundation, Dr. Owen H. Wangensteen, president of the foundation, announced.

The first such program to be established in the medical school, the scholarships will be awarded annually by the foundation in amounts totaling $2,500. Individual grants will range between $500 and $1,000.

Students who will be members of the sophomore, junior and senior classes in the fall are eligible to apply for the scholarships, and application will be open from July 15 to September 1 for the coming school year.

The establishment of a scholarship program was authorized at a meeting of the board of directors of the foundation a week ago, and Dr. Wesley W. Spink, professor of medicine at the University, was named chairman of a committee to draw up plans.

"There has long been a great need for undergraduate medical scholarships. Many students have had to take part-time jobs outside of school and it has been difficult for them to devote the amount of time needed to their medical studies," Dr. Spink said.

Other members of the committee which drafted the program were Dr. Howard Horns, assistant dean of the medical school, and Dr. George N. Aagaard, director of postgraduate medical education at the University and secretary-treasurer of the foundation.

Protruded Intervertebral Disc

Harold F. Buchstein, M.D.

Minneapolis, Minnesota

THE clinical entity here under discussion is and has been referred to by a number of terms: echondroma or chondroma of the intervertebral disc, ruptured intervertebral disc, herniated intervertebral disc, protruded or protruding intervertebral disc, herniated nucleus pulposus, slipped disc or simply "disc." It consists of a bulging or protrusion into the vertebral canal of a portion of the intervertebral disc and is thus by definition a special variety of intraspinal tumor. Although such protrusions may occur at any spinal level, we will confine the present discussion to such lesions at one or more of the lower three lumbar levels, since these lesions provoke a characteristic clinical syndrome, namely intractable sciatic pain.

Since organization of the neurosurgical service at this hospital on February 1, 1946, we have operated upon one hundred patients in whom the presence of a protruded intervertebral disc was postulated, suspected or was to be excluded. Disc abnormality of some type was found in 88 patients; two were found to have tumors and ten were found not to have abnormal discs. Six of this group were patients explored to exclude the presence of disc protrusion prior to spinal fusion. A group of 43 patients from whom herniated discs (see below) were removed was subjected to detailed analysis by Dr. C. K. Olson for purposes of this report.

Historical

The intervertebral discs were long neglected by pathologists and clinicians. The classical studies of Schmorl (1928) and Andrae (1929) called attention to herniations of the nuclear portion of the discs into the vertebral bodies but made only passing mention of protrusion into the vertebral canal. From time to time neurosurgeons (Mixter, Adson, Elsberg, Dandy) encountered and removed such lesions, usually while operating upon presumed spinal cord tumors. They were described as neoplasms of the discs and their true nature and frequency were not appreciated.

The modern history of the intervertebral disc begins with the reports of Mixter, Barr and Hampton from the Massachusetts General Hospital in 1934. They were the first to describe the true nature of lumbar protrusions, point out their relationship to "sciatica" and describe methods for their diagnosis and surgical treatment. Presently Love at the Mayo Clinic and many other neurosurgeons were reporting series of cases which rapidly extended into the hundreds and literally staggered the imagination of many physicians who were loath to believe that so common a lesion could so long have remained undiscovered. Today the lumbar protruded disc is generally recognized as the most frequent cause of the sciatic syndrome.

Anatomy and Pathology

The structure of the intervertebral disc is relatively simple. It consists of three parts: (1) Thin plates of cartilage cover the intervertebral surfaces of the vertebral bodies. (2) The annulus fibrosus, making up the periphery of the disc, is composed of obliquely directed bundles of fibers which bind together the adjacent vertebral bodies and form a container for the central (3) nucleus pulposus. This is the adult derivative of the embryonic notochord and is a white, moist plastic, mucoid appearing mass which is readily moldable. The intervertebral disc is virtually avascular but has been shown to contain numerous fine unmyelinated nerve fibers in the dorsal (posterior) portion of the annulus fibrosus and the overlying posterior longitudinal ligament.

The intervertebral disc gives the spine mobility and compressibility, acting as a "shock absorber." This latter function is important in preventing the transmission of sharp jolts from foot to head. It is obvious that the discs in the lower lumbar region are subjected to a considerable compressive force by the assumption of the erect posture and to additional strains by almost any sort of physical activity, such as lifting, carrying heavy objects, twisting the trunk, etc.

Degenerative changes, in the form of dehydration and loss of elasticity take place in the discs with increasing age, and these changes are particularly marked in the lower lumbar region. In certain individuals further changes occur which give rise to the lesions here under discussion. As observed at operation, several varieties of lesion occur.

1. The posterior portion of the annulus fibrosus although still unruptured may bulge or protrude into the vertebral canal sufficiently to irritate or compress a spinal nerve root. It is difficult to distinguish the truly pathological from the extremes of normal in this situation. Presumably when the bulge occupies a well defined area it is pathological whereas a broad and general bulging is probably normal. Occasionally we have encountered cases in which the structure of the vertebral canal was such that a relatively minor bulge sufficed to cause nerve compression. Lesions of this type were found in approximately 40 per cent of our cases.
2. The classical situation is one in which a rent or rupture has occurred in the posterior portion of the annulus fibrosus and some of the tissue of the nucleus pulposus has herniated through it forming a discrete and well defined tumor mass. In most instances this lies at one or the other lateral extreme of the vertebral canal, in just such a position as to lie in the path of the spinal nerve which is to

emerge from the vertebral canal through the intervertebral foramen next below. That is, a protruding disc at the L4-5 interspace impinges upon the fifth lumbar nerve root and a protruding lumbosacral disc impinges upon the first sacral nerve root. Depending upon the exact site of the herniation and the contour of the vertebral canal (whose dorsal wall is composed of ligamentum flavum), one of several things may happen to the nerve root: (1) It may be trapped in the lateral gutter of the canal, being compressed between the ligamentum flavum laterally and superiorly and the herniate disc medially and inferiorly. (2) It may be riding over the crest of the herniating mass. (3) It may be displaced medially.

In the second group of herniate discs, when the bulging mass is opened into with a probe or knife, there will follow in many instances the spontaneous extrusion of the loose fragment of nuclear tissue whose general appearance suggests that of a wad of mechanic's waste. In the others one or several such fragments may be readily removed with a forceps. The recovery of such a free fragment establishes the diagnosis of herniated disc beyond question. Herniated discs were found in approximately 60 per cent of our cases.

3. Occasionally, the free fragment will be found to have escaped completely and to lie loose in the vertebral canal. Such fragments may wander some distance from the site of their origin.
4. Occasionally there will be found a huge herniating mass arising from the center of the posterior aspect of the disc and largely filling the vertebral canal. Such herniations occur almost without exception at the level of the disc between the third and fourth lumbar vertebrae; they produce the symptoms of a cauda equina tumor rather than those of herniating disc.
5. In elderly individuals and about protrusions of long standing there may be found a considerable overgrowth of the borders of the adjacent vertebral bodies, i. e., lipping. In such instances the protruding portion of the disc is usually firm and its contents dry.

Patients may be found to have multiple protrusions of the lumbar discs, either simultaneously or at some interval of time. Such multiple protrusions are one source of recurrence of symptoms after an initially successful operation. In our series we encountered three patients in whom two discs were pathological. Five other patients had previously been operated upon elsewhere presumably with the removal of protruded or herniated discs at the same or other levels. Some authors have reported a much higher incidence of multiple disc protrusion, some as high as 30 per cent. I believe that these figures are the result of regarding a pathological slight protrusion which we would regard normal.

Symptoms

Protruded and herniated intervertebral discs occur chiefly in young adults engaged in strenuous occupations. The average age of the patients in our group was 35 years; all were male. In civil practice females constitute about one third of operated cases. A survey of patients' occupations shows that persons pursuing so-called sedentary occupation are by no means spared disc trouble. This fact suggests that degenerative changes play a relatively important role in the production of disc protrusion and herniation.

Patients from whom a herniated intervertebral disc is removed present clinical histories which are strikingly similar in their essential details. The present discussion will relate to herniations at the lower two lumbar levels, i. e., L4-5 and LS, since these constitute about 95 per cent of lumbar protrusions. In our surveyed group of 43 cases only one occurred at the third lumbar level, i. e., between the third and fourth lumbar vertebrae.

An outstanding characteristic of the disc syndrome is its prolonged and relapsing course. The first symptoms relating to the lower back usually antedate those which lead to the removal of the herniated disc by a considerable time. In our series of cases the time intervals varied from two months to 28 years and in approximately one third of the patients the interval was over five years.

The first episode of back trouble recalled by most of these patients was an attack of low back pain, either midline or lateralized but not radiating beyond the general vicinity of the sacro-iliac joint. In about half the cases the patient related this to some unusual back strain, such as heavy lifting, training in an obstacle course, falls on the buttocks, etc. In the others the pain followed no specific traumatic incident. But it may be recalled that many occupations, such as farming, ammunition passing, and working with a shovel, involve normally much activity which places severe stresses on the lumbar intervertebral discs.

It should also be noted that the pain does not always or even often follow immediately upon the traumatic episode when there is one. More commonly the patient may feel a sudden twinge of back pain but be able to continue his activities, after a fashion, for the rest of the day. The following morning upon attempting to get out of bed the back may be found to be stiff and any movement very painful.

These early attacks may confine the patient to bed or limit his activities for a few days to a few weeks. Commonly they subside under no treatment other than rest and limitation of activity. Taping of the lower back and manipulative therapy (chiropractic, osteopathic) are frequently credited by the patient with bringing prompt relief.

The exact pathophysiology underlying such attacks of pain is not known. It is assumed that they are due to stretching or tearing of the annulus fibrosus and/or the posterior longitudinal ligament.

Following such an initial attack of pain the patient may go for many months or even years without further trouble. More commonly, however, he has a succession of similar episodes of "lumbago" or "sacro-iliac". These may follow any unusual exertion or may come on for no apparent reason. A common experience is for the patient to stoop over, feel a "catch" or "snap" in his lower back and find it painful or even impossible to extend the spine again.

Finally, after a few days or many years, the patient develops the characteristic symptom of lumbar disc herniation, sciatic pain. This may develop as a shifting or radiation of the low back pain or it may come on without antecedent back pain during the current attack. It may be precipitated by the same types of trauma as were the former attacks of low back pain, i. e., movements involving stooping, twisting and lifting. Or it may appear for no assignable reason, e. g., the patient may awaken and find it virtually impossible to get out of bed because of pain.

The sciatic pain is typically confined to a single lower extremity, but may shift from side to side in succeeding attacks. The presence of bilateral sciatic pain suggests the presence of a midline protrusion but should also encourage a careful search for other possible causes of pain.

This sciatic pain is the result of irritation or compression of a nerve root by the herniated disc, i. e., it is a mechanical mononeuritis. It possesses the general characteristics common to all root pains. The pain follows a consistent and specific course and does not wander about; the patient can trace it out accurately on his limb. Beginning in the buttock (often referred to as the "hip") it passes down the posterior aspect of the thigh and the posterior or posterolateral aspect of the leg to the ankle; at times it may extend into the foot, either the heel, instep, or lateral border. During acute paroxysms of pain the pain will be felt along the entire course. Most of the time it may be concentrated largely in one region, as in the buttock or in the calf. Anything which suddenly increases the tension or compression of the nerve root will produce a sharp exacerbation of pain: coughing, sneezing, jarring of the leg as in stepping off a curb, straight leg raising.

Accompanying the sciatic pain are paresthesias in the form of numbness, tingling or a "sleepy" feeling. This may be described as being general throughout the leg but is more often localized to discrete areas corresponding to the dermatome of the nerve root being irritated. In the case of the fifth lumbar nerve root this area includes the dorsum of the foot and the great toe; the first sacral dermatome includes the lateral border of the foot and the last two or three toes.

Related to the paresthesias is a feeling of coldness in the foot complained of by some patients. Touching the foot may show it to be actually cooler than its fellow.

As is so frequently true in cases of intraspinal tumors of neoplastic character, these patients are prone to have much pain while in bed at night. The positions of maximum comfort and distress vary greatly from patient to patient, but a frequent complaint is that the sitting posture is the most uncomfortable. Such patients may be seen standing in the reception room waiting to see their physician.

Being mechanically produced, it is to be expected that most patients will relate the severity of their symptoms to the degree of their activity. Many learn to avoid certain movements because they know that they will almost certainly be followed by distress. Careful management may enable the patient to live with his disc fairly well.

Discogenetic pain is not related to changes in the weather in as striking a fashion as is the pain of rheumatic afflictions. Nevertheless, there is a tendency for some patients to suffer more in cold weather.

Physical Findings

The physical findings to be noted in a patient with a herniated disc will vary with the acuteness of his attack. Striking changes may appear suddenly and may leave almost as rapidly in some instances. During an interval between attacks of pain and absence of significant physical findings does not mitigate against the opinion that the patient's attacks are discogenic.

At the height of a severe attack the patient is often totally disabled, being confined to his bed and requiring opiates. Attempts to assume the erect posture bring on marked spasm in the erector spinae muscles of the lumbar region together with acute sciatic pain. The affected extremity is "weak" because of the pain.

Other patients, though able to be up and about, present obvious alterations in the alignment of their spinal column which, together with the pain, produce alterations in gait. Such patients walk with a limp favoring the painful side and perform all movements slowly and carefully to avoid jarring. Rolling over on the examining table is difficult for them. Examination of the back shows most frequently a loss of the normal lumbar lordosis. The lower back becomes flat or may even present a reversed lordosis, i. e., a gentle kyphotic curve. Almost as frequent is the presence of a list or tilt, usually away from the painful side. In some patients there is seen a so-called "sciatic scoliosis," that is an "S" shaped curvature of the spine associated with sciatic pain. This finding is almost pathognomonic of a herniated intervertebral disc. A very interesting variant of this finding is the alternating scoliosis, i. e., one in which the patient can reverse the direction of the curve by appropriate maneuvers but cannot bring the spine into straight alignment except in the prone position. Sciatic scoliosis is usually accompanied by a stooped posture, the patient being unable to stand erect.

With the patient standing there is usually evident spasm in the lumbar musculature. This, together with pain, limits motion of the lumbosacral spine. Forward bending is strikingly reduced. Hyperextension is likewise reduced and attempts to produce it passively may bring on sharp pain in the region of the lumbosacral joint. Lateral bending may be reduced, particularly to the side of the lesion.

Upon assuming the prone position the muscle spasm may subside to a considerable degree. Palpation with a

single finger tip will disclose discreetly localized areas of tenderness; these are to be distinguished from diffuse tenderness over the whole lumbar region. The latter suggests that the case is not one of herniated disc. Tenderness will commonly be found between the vertebral spines at the level of the lesion, i. e., between the fourth and fifth lumbar spines or between the fifth lumbar and first sacral spines. More significant, however, is tenderness located just a fingerbreadth lateral to the spines and over the vertebral interspaces. This will be present over the lesion and absent on the contralateral side. A particularly significant finding is the reproduction of the patient's radicular pain by such paravertebral pressure.

The sciatic nerve itself may be tender to pressure but this is not often a prominent finding. However, tests which put the nerve on stretch produce sharp exacerbations of the patient's pain and may also bring out paresthesias (numbness, tingling). Raising the extended leg off the bed as the patient lies supine is the common method of testing. Normally the leg can be raised to or near to the vertical, but the presence of a herniated disc pain and muscle spasm may limit elevation to a marked degree. With the leg elevated to a painful angle, further stretch may be applied to the sciatic nerve by sharply dorsiflexing the foot, a maneuver sometimes erroneously referred to as the Naffziger test. Sharp exacerbation of pain upon performance of the maneuver indicates the presence of an irritated sciatic nerve.

A physical finding which is highly suggestive of the presence of a herniated disc is the production of pain on the affected side by elevation of the leg on the unaffected side. The pain may be limited to the paravertebral region or may extend into the sciatic distribution.

Neurological examination will disclose findings indicative of irritation of one or more spinal nerve roots. The findings are a fairly reliable indicator of the level of the lesion. The knee jerks are not altered by disc lesions at the fourth and fifth lumbar levels. Occasionally some decrease of activity of the knee jerk is seen on the affected side but this is probably related to a tendency to hold the extremity in a state of voluntary spasm. The ankle jerk on the affected side is more significant. With protrusions at the lumbosacral level it is typically markedly reduced or absent, while with lesions at the fourth lumbar level it is normal in one half of cases, being moderately to severely reduced in the others. Very occasionally a patient is seen in whom there is present such a mild degree of irritation of the nerve root that the reflex will be hyperactive rather than reduced.

Sensory testing with a pin and whisp of cotton may disclose alteration (reduction) in sensibility which usually corresponds to the area of the patient's maximum paresthesias. Lumbosacral lesions typically produce hypesthesia and hypalgesia in the first sacral dermatome, i. e., along the lateral border of the foot, including the two or three lateral toes. Lesions at the fourth lumbar level produce similar changes in the fifth lumbar dermatome which includes much of the dorsum of the foot and the great toe.

Localization of the lesion by means of reflex and sensory changes is not entirely reliable because the motor and sensory distribution of nerve roots is subject to some variation. For example, we have demonstrated in one case that production of temporary interruption in the patient's first sacral nerve root produced sensory changes in the area usually supplied by the fifth lumbar nerve.

Actual motor weakness is not a prominent feature of most disc cases, since but a single nerve root is affected and most muscles are supplied by several roots. With lumbosacral lesions there may be some weakness of the posterior calf muscles but this is difficult to demonstrate clearly. With fourth lumbar protrusions, however, there may frequently be demonstrated a discrete weakness of dorsiflexion of the great toe. There may of course be a good deal of apparent weakness as the result of pain produced on movement.

A finding which we have come to place considerable reliance upon is the presence of significant degree of atrophy in the leg muscles as determined by measuring the maximum circumference of the calves. Differences of ½ inch or more were noted in 23 of the 30 cases in our series in which it was checked.

Occasionally one sees a patient who presents a classical history of low back pain followed by sciatica in whom most or all of the pain has subsided but who retains rather striking alterations in the lower back with spasm, loss of lordosis and tilt. Presumably the altered relationship of the vertebral components has served to relieve the pressure on the nerve root, with subsidence of pain. The bones cannot return to their normal positions, however, without there being precipitated a recurrence of the patient's pain.

Laboratory and X-Ray Findings

Laboratory studies of the blood and urine are useful only insofar as they help to exclude other possible causes of sciatic pain. An elevated blood sedimentation rate directs attention toward arthritic involvement.

If a myelogram is performed a specimen of cerebrospinal fluid is taken for examination. If no myelogram is performed a lumbar puncture is not made because of its slight value. The dynamics will not be altered. In almost every case a normal cell count will be found; the maximum count in our series was 14 cells per cubic millimeter and the average was 2 cells. The protein content of the fluid will be moderately elevated in something less than one half of cases. It was once felt that an elevated spinal fluid protein was almost essential to the diagnosis of herniated disc but this has long since been found fallacious.

Plain roentgenograms of the lumbosacral spine in both antero-posterior and lateral projections are made in every case. Their chief value is in the exclusion of other possible sources of sciatic pain, such as spondylolisthesis and malignant metastases. In most cases they will be reported by the roentgenologist as entirely negative. On occasion one may note in the X-rays the straightening

and listing of the lumbar spine also noted on physical examination; these are suggestive but not diagnostic findings. More interest attaches to reports of narrow interspaces. It will be recalled that the lumbosacral interspace is subject to considerable variation and therefore slight changes are not significant. In our series of 43 cases seven were reported to have a narrow interspace. In five of these the narrowing corresponded with the level of the removed disc; in the other two it did not. Thus this finding is not entirely reliable as either a diagnostic or a localizing sign.

Myelography

When herniated lumbar discs were first recognized as a clinical entity much doubt and confusion surrounded their diagnosis. Much of this arose from a tendency to regard them as rare and unusual lesions rather than as the most frequent cause of "sciatica." It was felt essential to establish the diagnosis by myelography in every case. With increasing experience, however, many neurosurgeons have come to rely more and more upon the diagnosis based upon a consideration of the history, physical findings and (negative) laboratory and X-ray examinations. Most radical in this respect was Dandy who stated that myelography was never necessary.

Myelography (known locally by the term "spinogram") is the demonstration of the spinal subarachnoid space by means of a contrast medium. The original substance employed was lipiodol, a poppyseed oil containing 40 per cent iodine. This gave excellent visualization but fell into disfavor because it was felt to be occasionally irritating and because it remained permanently in the spinal subarachnoid space. Here it presently became spread far and wide and presented a very startling appearance on subsequent X-ray examination. For this reason its use in cases involving litigation or compensation was often unfortunate.

To overcome these objections to lipiodol the technic of air myelography was developed. This consisted simply of filling the lumbar portion of the spinal subarachnoid space with air or oxygen and taking X-ray films. The contrast obtained was not sufficient to permit observation by fluoroscopy. This method was far from satisfactory since it was almost routinely followed by a severe headache and because its diagnostic accuracy was poor even with the best of films. The method has been abandoned.

The technic of aspirating the oil following fluoroscopy, developed in 1941, made it possible to enjoy the advantages of oil myelography while escaping its liabilities. The subsequent introduction of a new contrast medium, Pantopaque, has further simplified matters. Pantopaque is less viscous than lipiodol and therefore much more easily inserted and removed. While somewhat inferior for use in the thoracic and cervical regions, due to its tendency to break up into multiple droplets, in the lumbar region it is as good as if not better than lipiodol. It has the further advantage of being gradually absorbed from the subarachnoid space should it prove impossible to aspirate it after the examination is completed.

There exists a considerable diversity of opinion among neurosurgeons and orthopedists regarding the necessity and advisability of performing myelography in the diagnosis of herniated intervertebral discs. Some employ it routinely, and this is the policy of the Veterans Administration. Others resort to myelography only in doubtful cases; this is probably the most common practice among neurosurgeons. A few, such as Dandy, claim never to employ it.

In favor of the performance of a myelogram are the following considerations: With modern technics the procedure is in most instances simple and safe. Myelography may establish the diagnosis in questionable cases and may avoid exploration in others. It may indicate the presence of multiple lesions. It may suggest the presence of a neoplasm rather than a herniated disc. It serves accurately to localize the lesion. And it provides the only direct evidence of the lesion's presence available prior to operation; this may be of legal importance.

Against the routine performance of myelography it may be noted: While usually simple and safe, the procedure is sometimes very uncomfortable to the patient and is occasionally followed by a sterile meningitic reaction which may produce alarming symptoms of a week's duration. (We have had at least one such experience.) It introduces an added element of time and expense to the patient. It is not required for localization since this may usually be accomplished on clinical grounds and even if it is not the fourth and fifth interspaces are readily explored through the same operative exposure. Our experience has not suggested that multiple protrusions are frequent enough to justify the routine use of myelography and the same is true for neoplasms.

It should be emphasized that the interpretation of myelographic findings, both at fluoroscopy and on films, is a matter calling for considerable experience and judgment and that even granted these there are still many occasions on which the roentgenologist is able only to report suggestive changes even though the patient is subsequently found to have a very definite lesion. In our series of 43 proven cases of herniated disc, myelograms were not done in 17 cases, were reported as positive in 15 cases, were reported as suggestive in 9 cases and were reported as negative in none. In one of the suggestive cases the indicated level was the wrong one.

It should also be pointed out that it is perfectly possible to have a normal myelogram in a patient having a herniated disc. This may occur when the dural sac is relatively narrow in relation to the width of the vertebral canal and the herniation takes place far laterally in the canal. There was no example of this circumstance in the present series, but they have been observed elsewhere. The opposite also happens, namely the myelogram may demonstrate a mass which is not discovered at laminectomy. The cause of these false positives is not clear, but they do emphasize the lack of precision in the method.

Finally, an important objection to routine myelography, in my opinion, is that it tends to discourage the accurate clinical evaluation of the patient's problem. If a myelogram is performed there is too great a tend-

ency routinely to advise operative treatment if a disc is demonstrated and to reject the patient if none is found.

In summary, I believe that myelography is not necessary to accurate diagnosis in typical, relatively severe cases of herniated disc. It is useful in milder or confusing cases and as a means of checking on poor operative results. It should not be allowed to take the place of good clinical judgment.

Differential Diagnosis

Time does not permit a thorough consideration of the other lesions which may produce symptoms suggesting the presence of a protruding disc. The most important of these are due to anomalies in the bone structure in the lumbosacral region, such as spondylolisthesis. They may be identified by X-ray study. Since protruding discs may coexist with such lesions, myelograms are performed prior to spinal fusion and if there is any suspicion of the presence of a disc the vertebral canal is explored prior to fusion. In our experiences most such explorations have proven negative.

Rheumatoid spondylitis may usually be identified by means of X-ray changes, increased sedimentation rate and decreased chest expansion.

Neoplasms of the cauda equina may cause the disc syndrome but this is a rare occurrence. They will usually interfere with sphincter function, which herniated discs do not.

A most difficult problem is presented by the psychoneurotic patient with a back pain and/or sciatica. It is perfectly possible for a neurotic person to have a protruding disc. Long continued pain and loss of sleep may serve to exaggerate the neurotic symptoms. But one must beware of operating on such patients unless the indications for so doing are unequivocal, since a failure may lead to ever increasing complaint.

Treatment

The nonsurgical or so-called conservative treatment of protruding intervertebral discs is advised under the following circumstances: (1) When the diagnosis, though suspected, cannot be established with reasonable certainty. (2) During early attacks of pain, particularly if the sciatic syndrome is not fully developed. (3) If the attacks of pain are mild and respond readily to the measures presently to be outlined. (4) If there is some other contra-indication to surgery.

The essence of conservative treatment is rest for the lumbosacral spine. This is best achieved by complete bed rest, preferably in a semi-sitting position. Traction to the lower extremities is sometimes beneficial but at other times cannot be tolerated by the patient; this state of affairs is highly suggestive of the presence of a protruding disc.

Once the patient improves sufficiently to be allowed up, or if the symptoms are only moderately severe from the beginning, a support such as the Goldthwait brace may be used to advantage. If support is to be provided, it should be adequate. The usual so-called "sacro-iliac belt" does not provide adequate immobilization for many cases.

Manipulative therapy, as practiced by osteopaths and chiropractors and occasionally by physicians, is of definite benefit to many of these patients particularly during the early phases of their disorder, that is while still having attacks of lumbago. Once the disc herniates and sciatica sets in relief from manipulation is much less certain and not infrequently the treatment serves only to make the symptoms more acute.

Once over his acute attack the patient should be warned to avoid movements which involve flexion and rotation of the lumbar spine.

Surgical treatment is advised under the following circumstances: (1) When "conservative" therapy is no longer truly conservative, that is, when obtaining relief through rest requires such an expenditure of time and acceptance of partial disability as to render it too dear for the patient. (2) When the symptoms, even though they be of the first attack, are so severe as to leave no doubt that a complete herniation has taken place and that less radical measures have a very poor prospect of producing complete relief. The mere known presence of a protruding disc is not alone a sufficient reason for operating, for many persons, including not a few physicians, manage to get along reasonably well by careful limitation of their activity.

Injunctions against hasty operation in cases of protruding intervertebral disc are based on considerations other than the avoidance of unnecessary surgery. Even a modest experience with the surgical treatment of these lesions suffices to demonstrate that the quickest, most thorough and most appreciated relief follows operation in patients who have had a good deal of trouble and severe distress and who are found at operation to have a herniated disc, that is one from which free fragments may easily be removed. It is not unusual for such patients to require only one or two postoperative injections of morphine and to leave their beds on the third postoperative day in relative comfort. Patients in whom no disc abnormality or only a mild protrusion is found, on the other hand, are prone to have much more prolonged postoperative discomfort and to experience a less complete alleviation of their complaints.

The technic of operation for protruded and herniated intervertebral discs is now fairly well standardized among neurosurgeons. Its proper performance requires the possession of certain specialized instruments and suction and electrosurgical apparatus, together with an acquaintance with the technic of intraspinal surgery. Technical details lie beyond the scope of this presentation. It may be pointed out, however, that the operation is conducted through a short (2 to 3 inch) incision and does not involve the removal of any bony structure important to the weight-bearing function or stability of the vertebral colunm. The protruding or herniated portion of the disc is first removed following which all remaining tissue of the nucleus pulposus that can be secured is removed. The patient may be permitted out of bed within three days to a week and is able to return to some activity in from two to eight weeks depending upon his progress. Strenuous activity is prohibited for six months.

Spinal fusion is performed in conjunction with removal of the disc when the bony structure of the lower back is defective or unstable, when the patient's complaint includes backache of a static character, i.e., one relieved by rest and immobilization, and when the patient pursues a particularly arduous occupation and desires maximum protection against future trouble. In our series of 43 herniated discs only three were subjected to spinal fusion; this figure is lower than those reported from most clinics.

RESULTS

Several factors influence the results of operation for disc disease. As already indicated, patients from whom a truly herniated disc are removed obtain results superior to those obtained by patients with simply a protruding disc. The adequacy of operation is an important factor. We have had several occasions to remove further disc material from the site of a previous removal which was considered complete at the time of its performance. Due to purely mechanical difficulties a few fragments may be overlooked only to cause trouble later. Excessive scarring in the epidural space following surgery may cause prolonged symptoms. Re-exploration of such a case dramatically emphasizes the necessity for avoidance of all unnecessary operative trauma to the nerves and other tissues of the vertebral canal.

The factor of compensation plays a significant role in industrial and veteran cases. It is notoriously much more difficult to obtain a good result in such patients than in those who obtain no financial gain from continued disability.

The results which we have obtained compare favorably with those reported elsewhere and demonstrate, we believe, that operation in properly selected cases offers the patient his best chance for rapid, complete and lasting relief from pain. At the time of their dismissal from the hospital, from one to three weeks following operation, our 43 cases of herniated disc showed improvement in the following degrees:

None	0 cases
Slight	1 case
Moderate	2 cases
Marked	30 cases
No residual symptoms	10 cases

We have had opportunity to make follow-up examinations on 20 of these patients at intervals varying from 2 to 11 months. Thirteen of these patients were free from backache, five had slight pain and one had moderate distress in the lower back. Fifteen of the twenty were free from radicular (sciatic) pain, four had occasional twinges and one had moderate leg pain. An estimate of the patients' work capacity disclosed that none of them were incapacitated. In two the work capacity was estimated as only fair, in seven as good and in eleven as excellent. This latter group found themselves able to carry out any tasks they set themselves to. Only three patients are known to be wearing a low back support. One man, who has had two discs removed at separate operations has been accepted for re-enlistment in the AAF.

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The literature relating to the intervertebral disc problem is voluminous but much of it is simply repetitious of what has been said before, a characteristic shared by this report.

Interested students are referred to the monograph by Bradford and Spurling (The Intervertebral Disc, Charles C. Thomas, 2nd ed., 1945) which contains an extensive bibliography.

Attention may also be drawn to the symposium on the intervertebral disc, edited by J. Grafton Love, in Archives of Surgery, March 1940.

CONTINUATION COURSE IN ANESTHESIOLOGY

The Department of Postgraduate Medical Education of the University of Minnesota Medical School announces a continuation course in Anesthesiology to be held September 12, 13, 14. The course is not intended for full-time anesthetists but is rather directed toward those physicians who spend a portion of their time as anesthetists. Emphasis will be placed on anesthetic agents commonly used by part-time anesthetists. Clinical problems frequently encountered in anesthesiology will be stressed. Distinguished visiting physicians who will participate as members of the faculty for the course include Dr. Stewart Cullen, Professor of Anesthesiology, University of Iowa Medical School; Dr. John Adriani, Director, Department of Anesthesia, Charity Hospital, New Orleans, and Dr. J. S. Lundy, Chief of Anesthesia at the Mayo Clinic, Rochester, Minnesota. The remainder of the faculty of the course will be made up of full-time and clinical members of the staff of the University of Minnesota Medical School.

Congenital Absence of Vagina

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Congenital absence of the vagina resulting from faulty development or fusion of Müllerian ducts is fortunately a rare malformation. Surgical correction is certainly advisable in suitable cases and should be attempted in young women with well established sex characteristics not only for providing a means of cohabitation but also to overcome any co-existing inferiority complex or sex neurosis. Counseller[1] advocates that the operation be done only in women who are normally developed otherwise or those who contemplate marriage. TeLinde [2] and Geist[3] believe that the optimum time for attempting the formation of the vagina is usually about six months prior to marriage if a cutting operation is planned.

Choice of Method

Many ingenious operations have been devised for the formation of an artificial vagina. The purpose of all these operations is to open a passage between the bladder and rectum to provide a suitable epithelialized passage. Miller [4] and Wharton [5] prefer one of two procedures.

1. Formation of a channel between bladder and bowel and continued use of an obturator until the epithelialization has taken place by ingrowth from vestibular epithelium.

2. Dissection and use of an obturator covered by split thickness graft.

The standard for a successful result is an epithelialized soft, pliable, vaginal tube showing no unusual or excessive amounts of scar tissue or contraction after three months. The split thickness skin graft technique is believed to be superior. However, if there is only a partial absence of the vagina, dissection and use of an obturator may be entirely adequate. Biopsy and histologic examination of the transplanted normal skin into the artificially produced vaginal channel appears to assume the histologic as well as physiologic characteristics of normal vaginal mucous membrane.

There are numerous other and older methods which have fallen somewhat into disrepute as they are more time-consuming and yield less favorable results than the Wharton technique and its modifications. Indeed some of the operations are now merely of historical interest. According to Masson the mortality rate is the greatest objection to the Baldwin technique which cannot be safely used in all cases, especially when the mesentery of the ileum is too short. Masson [6] favors the McIndoe method or modification of it using inlaying Thierch graft from thighs implanted into the vagina over a non-irritating lucite vaginoform. The Schubert method substitutes the rectum instead of the ileum for the vagina. The Graves operation utilizes pedicle grafts from the labia minor and adjacent surfaces of thighs to line the artificially formed canal. It and the Brady modification using a perineal skin flap are still useful procedures in selected cases although considerable opportunity for scar tissue formation is given. If the labia are small it is almost impossible to use the Graves technique. Modifications were offered by Frank and Geist using tubular grafts from the thighs. The use of skin and pedicle grafts alone often requires prolonged hospitalization and repeated operations due to secondary contraction.

"Use of Pressure" with Fall or Frank method seems to be practical and to give satisfactory results in some cases. The Frank non-surgical method although time-consuming, does not require hospitalization and is simple but demands intelligent cooperation of the patient. A vagina that is created non-surgically is less apt to contract than one formed by surgical methods. The Falls operation is of value when a rudimentary vestibule is present and in cases who cannot be depended upon for the prolonged intubation required by the Frank technique. In the Fall method a disc of mucosa is undercut, outlining the hymen. This is pushed in as far as possible and allowed to rest on the posterior wall of the newly created space. The pouch is further deepened by wearing a vaginal plug as in the Wharton procedure. Fall [7] considers this method totally devoid of danger.

Discussion and Surgical Considerations

There are some difficulties and possible accidents encountered in construction of a vaginal using the mold with or without skin grafts. By observing certain precautions and operative considerations these obstacles can be largely overcome. The requisites for a good result:

1. Meticulous care in obtaining a dry field to be grafted.
2. Obtaining in one piece uniformly good thin grafts.
3. Use of an obturator for several weeks or until marriage.

The dissection is usually easy, unless operations have been performed before. It is well to put a rectal tube into the rectum before operation and to instill a methylene blue solution into the bladder through a Foley retention catheter or have an assistant hold a urethral dilator in the bladder. Several molds of various sizes covered with two thicknesses of rubber condom should be available. Blunt and occasionally sharp dissection is used to create the space between the rectum and bladder which should be larger than normal since the walls tend to contract. The diameter of the dissected space should be wide enough to admit three fingers so that the form can escape early if intrapelvic pressure is unduly in-

Presented at the meeting of the Minnesota Society of Obstetrics and Gynecology, St. Paul, Minnesota.

creased. The depth of the space should be 11 to 13 cm. Complete hemostasis is essential so that the grafts may lie on a dry surface. The lateral walls at the base of the broad ligament are most likely to bleed. If they do not yield with blunt dissection they must be cut, as they will constrict the vagina. Some of these areas are vascular and should be ligated by transfixation. The cervix should be located if possible.

With the entire absence of the vagina there is usually an associated absence or arrested development of the uterus and not infrequently of the adnexae. One may be able to feel the ovaries, rarely it is possible to feel the bulbous median ends of the tube. The rest of the genito-urinary system should also be examined as occasionally there may be defects such as absence of one kidney, double kidney, or ectopic kidney. Brady[8] advises that intravenous pyelograms should be taken before operation in any women with congenital gynecologic abnormality.

The condom-covered artificial phallus of balsa wood is inserted into the artificially made vagina. The plug should fit snugly but not too tightly. In placing it in the cavity one must be certain that it does not compress the urethra against the under surface of the symphysis or make excessive pressure against the rectum. To avoid the danger of rectovaginal septum perforation, Wharton[9,10] has recommended: (1) the vaginal form should never be so short that it lies completely above the muscular plane of the pelvic diaphragm. The form should be long enough to protrude slightly from the vaginal orifice. (2) Make vaginal orifice so large that it could not close or contract over the end of the form. The opening should be large enough to allow the form to escape if the intrapelvic pressure is increased. It should always be easy to reach and remove the vaginal form. (3) Constipation is to be avoided. If constipated, avoid pressure to produce defecation. An indwelling urethral catheter may be used, keeping it in the bladder for four or five days.

The Thiersch grafts are sewed loosely over the cylinder with interrupted sutures of finest catgut. The form is then inserted into the space and not disturbed for

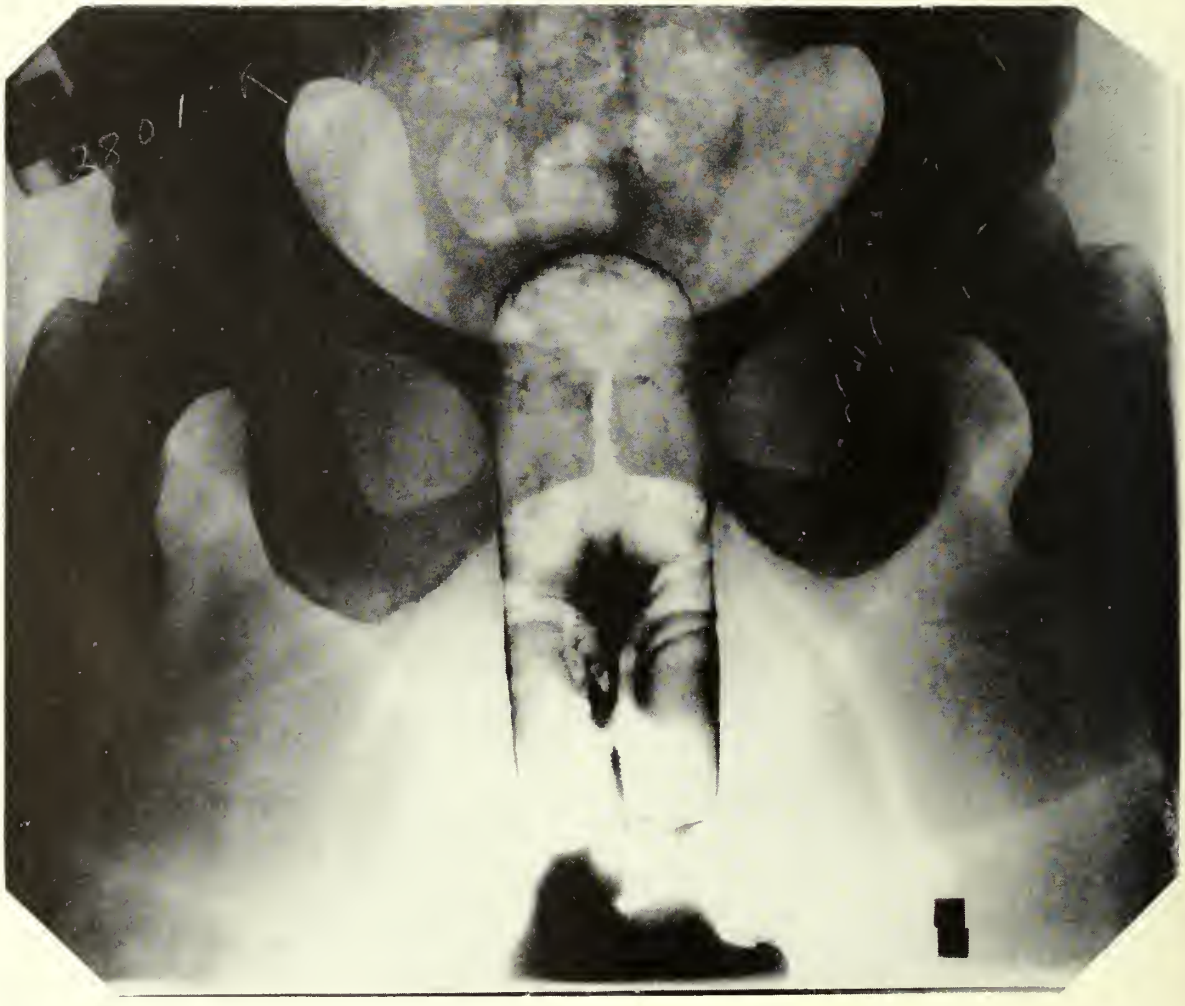


Fig. 1. A. P. X-ray of lower portion of pelvis on October 20, 1947, showing vaginal mold in place after bismuth paste had been applied to the vaginal walls and plug to act as an opaque contrast material.

about two or three weeks, at which time the graft should have taken. Epithelialization is noted; the plug (after being washed in normal saline) is then reinserted and worn almost continuously for about a month. A sanitary belt is worn to keep the mold in place. After that it can be worn only part of the time, if needed. Coitus is begun carefully after epithelialization is firm and complete, usually about two months after operation, if lubricants are used and trauma is avoided. Thiersch grafts avoid dependence on proliferation of vaginal epithelium. If a skin graft is not used, complete epithelialization may require months.

Whitacre and Chen [11] emphasize the importance of keeping the artificial vagina open once it has been constructed. This must be done by normal cohabitation or by artificial dilatation.

Large doses of estrogen help to maintain vaginal calibre and epithelium but with indifferent results. According to Counseller if the skin graft is accurately cut as a Thiersch graft, practically no scar at end results. If a full thickness graft is inadvertently taken a scar will result. Radium therapy can be used for scars. The grafts are usually taken from the abdomen or thighs.

Counseller [12] recently reported 70 patients in which the technic of McIndoe was employed or in which a "lucite" mold covered by a Thiersch skin graft taken from the abdomen or thigh was used. He states that although the surgical treatment produces a high percentage of good results, there will be some poor results and even failure in the management of any congenital anomaly by virtue of the defective quality of tissues with which the surgeon must work.

Case Report

S. P., age 22, an unmarried white woman, was first seen by me on September 20, 1946, complaining of failure to menstruate and being overweight. She had consulted a physician several years ago because of primary amenorrhea and was told that she had no uterus. She was engaged to be married and had normal libido. Periodically she had attacks of cramp-like pain and tenderness in her lower right quadrant.

Examination revealed a well-developed, moderately obese young white woman. She was of high intelligence and very desirous of having the congenital absence of vagina corrected. General physical examination showed essentially normal findings. Body contours were distinct-



Fig. 2. Vaginal biopsy taken on September 30, 1947. No hair follicles or glands present

ly feminine. Breasts were well developed as were the external genitalia. There was a slight dimple in the perineum between the labia minora indicating the normal location of the vaginal orifice. On recto-abdominal examination no uterus or cervix could be palpated.

Laboratory studies revealed a hemoglobin of 95 per cent. Urinaylsis was normal. Blood Wassermann and Mantoux tests were negative. Her basal metabolic rate was —12 per cent.

On February 17, 1947, at Swedish Hospital under pontocaine spinal anesthesia, the abdomen was opened suprapubically. Both tubes and ovaries were found to be present, the tubes being connected across the dome of the bladder by a thin fibrous band. No uterus was found. As patient had had some trouble with pain in her right side, the appendix was removed. An indwelling Foley catheter was inserted into the bladder and a small amount of Methylene blue instilled. A rectal tube was inserted into the rectum. An artificial vagina was then constructed using the Wharton technique with Thiersch skin grafts. A space about 11 cm. deep and about three fingers in width was created by blunt and sharp dissection up to the region of the peritoneum. Two Thiersch skin grafts (about 4x3 inches in diameter and 2 mm. thick), were taken from the left side of the abdomen and sewed loosely over a bulbous balsa wood plug 12 cm. in length and 4.5 cm. wide. The skin graft was done by Dr. Earl Henrikson. This vaginoform covered with the skin graft was inserted into the dissected space. The vaginal mold was large enough so that the lower end projected over the vaginal orifice below the pelvic floor. Postoperative course was uneventful. Patient placed on estrogenic therapy. Vaginal mold removed easily on March 9, 1947, and found that the skin grafts had taken well. Patient discharged from hospital on March 11, 1947, after having been instructed how to remove and re-insert vaginal plug. Biopsy taken from vagina on March 20, 1947, and September 30, 1947, revealed a negative vaginal biopsy with no hair follicles or glands present. The vaginal graft gradually took on the appearance of vaginal mucosa, being soft, moist and pliable. When last seen, on September 15, 1948, the patient had a roomy, satisfactory vagina with no scar tissue or contraction.

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UNIVERSITY OF MINNESOTA CONTINUATION COURSES

A course in Psychosomatic Medicine for general physicians will be presented by the University of Minnesota Medical School at the Center for Continuation Study, September 12 to 24. Emphasis will be placed upon interview techniques and the actual care of patients with emotional problems. A major part of the teaching will be done in the Out-Patient Department of the University of Minnesota Hospitals where the registrants will gain clinical experience under the supervision of experienced advisors.

On October 3, 4, 5, a course in Infectious Diseases will be presented. This course is intended for general physicians and will emphasize the diagnosis and management of the more common infectious disease problems. Dr. Louis Weinstein of Boston, Massachusetts, will be the visiting faculty member for the course and will discuss the pneumonias and current concepts of the common cold and influenza.

Other members for the faculty of the courses will include full-time and clinical staff of the University of Minnesota and the Mayo Foundation.

Recent Advances in Surgery of the Colon

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As a basis for consideration of changes which have taken place during recent years in the field of surgery of the colon, I should like to review briefly some of the principles and practices established before the introduction of chemotherapy. Present concepts of preoperative preparation and of postoperative care, apart from chemotherapy, had been established. Technical methods had become fairly well standardized and the principle of staged operations was almost universally accepted. Resection of any segment of the left portion of the colon with immediate anastomosis was regarded as a hazardous undertaking, and had been superseded by exteriorization.[1-4] Intraperitoneal anastomosis was employed commonly after resection of the right portion of the colon, but exteriorization was also carried out in spite of the disadvantages of a temporary ileac stoma. Success in reducing the incidence of peritonitis by such technical methods was limited, and this complication still accounted for the majority of postoperative deaths and still developed unpredictably. The mortality rate in relation to resection of a segment of the left portion of the colon remained in excess of 10 per cent and that associated with the removal of the right part of the colon was only slightly less. In general, the threat of peritonitis and death was so great in operations on the colon that all other considerations were secondary. Prolonged hospitalization and multiple admissions to the hospital, the time necessary to carry out resection in stages and the nuisance of temporary or at times permanent colonic stomas were accepted as more or less necessary evils in the cause of diminishing the mortality rate associated with operations on the colon.

Chemotherapy

During 1939 and 1940 the hospital mortality rate associated with operations on the colon decreased by more than 50 per cent, and this improvement in rate coincided with the first use of sulfonamide drugs in the peritoneal cavity.[5] At first these drugs were used in only occasional cases, both because of skepticism that much could be achieved by any such means and because of the possibility of toxic reactions. By 1940, however, sulfathiazole had become the drug of choice because of its polyvalence and delayed absorption, and because experimental investigations and clinical experience had demonstrated the safety of leaving 5 to 10 gm. of the drug within the peritoneal cavity. Similarly, after several months' experience with the drug, the clinical results were so striking that it came to be used regularly. I do not know of any reasonable explanation for the comparatively sudden decrease in mortality rate, apart from chemotherapy. At the Mayo Clinic, during the period in which the mortality rate decreased, the personnel of the surgical staff did not change, surgical technics and methods of preoperative and postoperative care remained essentially the same except for the local use of sulfonamides and the patients seen during these two years did not differ in any fundamental way from those seen previously. The decline in hospital mortality rate could not be attributed to selection of patients since resectability rate actually increased during the two-year period.

Further advances in the use of chemotherapy in colonic operations have since been made. Poth and Knotts[6] in 1942 introduced succinylsulfathiazole (sulfasuxidine) and demonstrated that the drug was capable of reducing the bacterial content of the bowel many thousandfold. Their demonstrations in the experimental laboratory of the increased safety in opening the colon after preparation with sulfasuxidine have since been widely confirmed both experimentally and clinically. More recently, phthalylsulfathiazole (sulfathalidine) has been demonstrated to be equally effective, in smaller doses than sulfasuxidine, in reducing bacterial counts, and one of these two agents is now generally used in preoperative preparation. The value of penicillin in operations on the colon is more equivocal. Its action against gram-negative organisms is limited, but since complications are rare there seems to be no serious objection to its use. The use of streptomycin orally and systemically in operations on the colon is so recent that it cannot as yet be adequately evaluated.[7] An incredible reduction in the number of organisms in the bowel occurs after its use orally. The effect is fleeting, however, and within several days the number of organisms returns virtually to the original level, in spite of the same or increased doses of streptomycin. The early development of streptomycin-resistant organisms and the seriousness of complications of the eighth nerve detract somewhat from its routine use. On my service, the drug is used preoperatively only for those patients with a known sensitivity to sulfonamides, and postoperatively only when the development of infection seems more likely than usual. Rarely, streptomycin is administered for a period of forty-eight hours preceding operation in addition to sulfasuxidine or sulfathalidine; however, if safer modifications of streptomycin are developed some such scheme may be adopted routinely.

Current Methods

As a direct consequence of the decrease in risk in colonic operations, marked changes, particularly in technic, have occurred. Since technical considerations differ in the removal of different segments of the bowel, and

Read at the meeting of the Northern Minnesota Medical Association, Duluth, Minnesota, August 20, 1948.

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since methods for the removal of certain segments are controversial, they will be discussed separately.

Lesions of the Terminal Portion of the Ileum and Right Portion of the Colon. Two-stage resection of the right portion of the colon has been almost entirely replaced by the single-stage operation. This is probably the most satisfactory operation on the colon, from the standpoint of both risk and extent of resection. The methods of re-establishing continuity of the bowel have not become standardized, and there does not seem to be any essential difference in the risk involved or the results obtained by use of side-to-side, end-to-end, or end-to-side ileocolostomy.[8] The two-stage procedure of ileocolostomy followed subsequently by resection is still occasionally advisable. When malignant lesions are complicated by obstruction or marked local inflammation, it may be safer to carry out the operation in two stages rather than in one stage. In many cases of regional enteritis, the patient's general condition may be so poor that the first operation should be limited to ileocolostomy with division of the ileum. As a rule, this limited procedure is followed by virtually complete recovery and resection of the terminal portion of the ileum and the right portion of the colon may be carried out subsequently. During the past few years at the clinic fewer than 10 per cent of carcinomas of the right portion of the colon were managed by two-stage resections, and in 1946 less than 5 per cent were so managed.

Lesions from Midtransverse Colon to Rectosigmoid. Perhaps the most striking change in operations on the colon during the past decade has been the revival of segmental resection with primary anastomosis in the management of lesions of the left portion of the colon. In spite of the many disadvantages of exteriorization operations, their safety formerly was such, compared to segmental resection with primary intraperitoneal anastomosis, that the proposal to return to the older, notoriously hazardous method was met with much hostility. As cases accumulated, however, it became evident that, after preparation with sulfasuxidine or sulfathalidine and local use of sulfathiazole, intraperitoneal anastomoses were not unduly dangerous. It is probable that in selected cases, at least, segmental resection with intraperitoneal anastomosis is as safe as, and perhaps safer than, exteriorization. Certain conditions must be met, however, if the safety of the procedure is to be preserved. Obstruction must be absent; the sectioned ends of the bowel to be used for the anastomosis must be free from inflammatory thickening; both segments must have an adequate supply of blood, and the suture line must be without tension. Marked obesity, particularly an excessively fat mesocolon, also may be a contraindication. The method has not proved particularly satisfactory in cases of diverticulitis because of inflammatory change in and about the bowel.

In cases of carcinoma the most frequent contraindication is obstruction. At the clinic in 1946, lesions of the sigmoid were treated by some form of exteriorization in about one third of the cases while in two thirds of the cases segmental resection was possible. Earlier, segmental resection with primary anastomosis was almost always accompanied by a proximal colonic stoma which completely diverted the fecal stream. The stoma was established either at the time of resection or at a preliminary operation. The addition of the stoma made the entire operative procedure as time-consuming as an exteriorization [9] and as many stages were required to complete the operation. With increasing confidence in the safety of intraperitoneal anastomosis, use of the proximal colonic stoma is being gradually abandoned. The hospital mortality rate associated with segmental resection and primary anastomosis, without a colonic stoma, is approximately 3 to 4 per cent, but I hasten to add that patients must be selected for the operation and that exteriorizations still have an important place in operations on the left portion of the colon.

In addition to the technical considerations previously discussed, a profound change toward increasing the magnitude of the operation has taken place in the removal of lesions in the segment of bowel under consideration. In cases of exteriorization, the extent of resection of both bowel and mesocolon tended to be limited. In cases in which primary anastomosis can be carried out, many limitations of exteriorization are avoidable and the resection can be made far more radical. It is not uncommon now, in operations for lesions of the splenic flexure or descending colon, to carry out massive resection of the left part of the transverse colon, splenic flexure, descending colon and corresponding mesocolon, and to re-establish colonic continuity by means of an anastomosis between sigmoid and transverse colon.[10] There seems to be little doubt that the more satisfactory late survival rates after resection of the right part of the colon for carcinoma as compared to those after more limited resections of a segment of the left part of the colon, as practiced in the past, were due in part to more radical removal of regional lymph nodes. The increased magnitude of resection of the left portion of the colon which is now being practiced should improve the late survival rates.

Lesions of the Rectosigmoid. I should like to consider lesions of the rectosigmoid as those situated so low in the bowel that they cannot be satisfactorily exteriorized. In the past, the standard operative procedure was combined abdominoperineal resection, or one of its many modifications, and the patient was left with a permanent abdominal colonic stoma. Attempts have been made by Dixon,[11] and by others,[12] since the early 1930's, to carry out a segmental resection of this portion of colon (low anterior resection) with primary anastomosis between sigmoid and rectum in order to avoid a permanent colonic stoma. The hospital mortality rate of approximately 20 per cent before 1940 discouraged wide usage of the operation. When the safety of primary anastomosis after resection of more proximal segments of bowel was demonstrated, and particularly when Dixon,[13] after the introduction of chemotherapy, was able to carry out low anterior resection with a hospital mortality rate of 1.5 to 3.0 per cent, resection of the rectosigmoid with primary anastomosis was more widely adopted. At

the time of this report, low anterior resection at the Mayo Clinic is associated with less risk than combined abdominoperineal resection when employed to remove lesions of the rectosigmoid. This, coupled with the avoidance of a permanent colonic stoma, has made low anterior resection the standard procedure for many lesions of the rectosigmoid at this institution. The danger of leakage from the low anastomosis probably is greater than that following anastomosis between more proximal, peritonized segments of bowel so that a proximal colonic stoma is generally established.

In carrying out anterior segmental resection the anastomosis becomes increasingly difficult the lower the lesion is situated in the bowel; in many cases in which lesions are located in the upper part of the rectum or lower portion of the rectosigmoid, particularly in cases of males who have narrow, deep pelves, primary anastomosis by suturing after resection cannot be carried out satisfactorily. In an effort to avoid a permanent abdominal colonic stoma in such cases, sacral or perineal stomas, with or without preservation of the anal canal or sphincter muscle, have been employed virtually since the beginning of operations on the colon.[14] Such operations were gradually abandoned in English-speaking countries after the introduction of combined abdominoperineal resection by Miles[15] in 1908, but they were never given up in Europe. Babcock[16] reintroduced the principle of preservation of the sphincter and formation of the perineal colonic stoma in this country in 1933 and has remained a vigorous proponent of the operation since. Such procedures were not widely adopted, however, until the past few years, when, with the lessened risk associated with operations on the colon, the question of preserving fecal continence again has been raised. Whether the lower portion of the rectum or the sphincter should be preserved if lesions are located in the rectosigmoid and upper part of the rectum is most controversial.[17] Combined abdominoperineal resection for lesions in this level has been accompanied by less satisfactory late survival rates than has removal of lesions of either more proximal or more distal segments of the bowel. In view of this, efforts to decrease the magnitude of combined abdominoperineal resection have been severely criticized.

The lymphatic spread of carcinoma of the rectosigmoid and rectum has been studied intensively during recent years, and Miles's contention that the three zones of lymphatics by which this spread takes place need to be removed in every case has been challenged. The findings in all studies[18–22] agree well and may be summarized as follows: (1) The usual route of spread is by way of the lymphatics which accompany the superior hemorrhoidal vessels. The spread may be discontinuous and involved nodes may be found many centimeters proximal to the lesion. (2) Lymphatic spread more than 1 cm. distal to the primary lesion does not occur until proximal lymphatics are blocked, and, in any case, distal spread is not extensive. (3) Lateral spread, through lymphatics that course along the levator ani muscles and accompany the middle hemorrhoidal vessels, does not occur when the distal edge of the lesion is higher than 6 cm. above the dentate margin.

Such findings obviously lend support to the conception that lymphatics distal to the lesion and those in Miles's lateral zone of spread need not be widely sacrificed in many cases of carcinoma of the upper part of the rectum and rectosigmoid. The widest possible removal of proximal lymphatics is necessary, particularly in view of the discontinuous spread observed in the superior hemorrhoidal and inferior mesenteric zones. Because of the lateral spread of lesions in the distal 6 cm. of rectum, the bowel should be amputated and effort should not be made to preserve the sphincters and levator ani muscles. The implications of these studies of spread by way of the lymph nodes are being confirmed clinically in that late survival rates after sphincter-preserving operations and low anterior resection are comparable with those achieved after combined abdominoperineal resection.

Of the operations which have been proposed with the idea of preserving continence, the best known in this country is that of Babcock.[16] The original procedure has been modified by him and by his colleague, Bacon, but remains, as far as preserving continence is concerned, a sphincter-preserving procedure. Control following such operations is only relative, and usually the patient must manage the perineal stoma much as an abdominal stoma is managed; that is, by means of diet, irrigations or cathartics. Currently, other operative procedures are being proposed with the idea of improving the degree of control achieved by sphincter-preserving procedures. From the experimental work of Gaston[23] it would appear that the lower few centimeters of rectum are essential to normal control, and I[24] have recently been able to carry out satisfactory anastomosis 2 to 3 cm. above the dentate margin, using a modified pull-through procedure. Control after this procedure, which can be described as a combined abdomino-endorectal resection, is normal. The operation is so promising that further trial seems justified.

Rectum. Changes in surgical procedures for the management of lesions of the midrectum and lower portion of the rectum have been less marked than those for lesions of the rectosigmoid. In the majority of such cases the rectum must be removed and questions of continence and preservation of intestinal continuity cannot legitimately be raised. The transition from staged operations to one-stage abdominoperineal resection started before 1940 and within a few months after the introduction of the sulfonamide drugs it was almost complete. The establishment of a proximal colonic stoma as the first stage of a combined abdominoperineal resection is now employed chiefly as a test of surgical procedures, in the case of those patients who present unusually high operative risks. Posterior resection, such as the Lockhart-Mummery operation, is used less frequently than formerly. Posterior resection is far less radical in the removal of proximal lymphatics than is combined abdominoperineal resection, and the double-barreled colonic stoma and blind segment of colon distal to the stoma are distinct disadvantages. Formerly posterior resection was used commonly to remove lesions in the lower third of the rectum; now its use is restricted almost exclusively

to the treatment of extremely poor risk and obese patients whose lesions happen to be low in the rectum. Combined abdominoperineal resection is a procedure of considerable magnitude and is associated, at present, with a risk of approximately 5 per cent. This is definitely higher than the risk associated with the removal of more proximal segments of the colon, and is attributable to the magnitude of the operation. The morbidity and time required for recovery have been greatly reduced by primary closure of the posterior wound, which is now commonly practiced.

SUMMARY

The gratifying decrease in the risk of removing any segment of the colon, which occurred during 1939 and 1940 and which I believe is due to chemotherapy, has been followed by marked changes in colonic operations. For lesions of the right portion of the colon, one-stage resection with ileocolostomy has become the standard procedure, the risk of which has been diminished to 2 to 3 per cent. For lesions from the midtransverse colon to the lower part of the sigmoid, segmental resection with primary intraperitoneal anastomosis, usually without a proximal colonic stoma, is now employed routinely. Exteriorization procedures still, however, have a definite place in the management of such lesions and should be employed whenever obstruction, marked inflammatory reaction, unusual obesity or other technical factors make end-to-end anastomosis unsatisfactory technically. For lesions of the lower portion of the sigmoid, the rectosigmoid and the upper part of the rectum, segmental resection and primary anastomosis, usually with a proximal colonic stoma, are employed widely at no greater risk, in selected cases at least, than that incurred with more proximal lesions. For the management of somewhat more distal lesions, particularly those of the upper part of the rectum, sphincter-saving and other abdomino-endo-anal or endorectal operations have been reintroduced, to avoid the necessity of a permanent abdominal colonic stoma. For lesions of the midrectum and lower part of the rectum, single-stage combined abdominoperineal resection is the operation of choice. The hospital mortality rate of a procedure of this magnitude still remains at approximately 5 per cent, while segmental resections of more proximal segments of the bowel are associated with a mortality rate of approximately 3 per cent.

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Control of Communicable Diseases

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The control of communicable diseases is a community problem that can be successfully resolved only by united action on the part of the entire community. Business men, home owners, health officers, nurses, sanitarians, educators, engineers, and practicing physicians all have a vital part to play.

Techniques—Isolation and Quarantine

Among the techniques used in communicable disease control, segregation, isolation, and quarantine have come down to us from antiquity. In the Middle Ages people fled from the plague-devastated cities of Europe, often carrying the disease into other areas with them. Countries developed quarantine laws and inspection services for self-protection, and although isolation and quarantine are still practiced, we now regard them as imperfect tools. During the past two decades there has been a consistent tendency to decrease the arbitrary time assigned for quarantine of many of the communicable diseases, and to continuously restrict the number of specific diseases for which it is employed. This is in line with present-day knowledge of the spread of these diseases since it has been amply proven that isolation and quarantine are not broadly effective. For example, during the early part of this century scarlet fever cases were isolated for 35 to 42 days, or until the termination of desquamation. All who have studied this disease are impressed with the lack of success in controlling and preventing scarlet fever by isolation. There are communities in England and Norway that for 30 years have practiced no isolation or restrictions in scarlet fever, and their experience in the incidence of the disease does not materially differ from those communities that have practiced extended isolation and quarantine. At the present time in New York City the minimum period of isolation is only seven days. Recent work would seem to attribute even less value to the isolation of persons with other communicable diseases. Actually, the best reason for continuing these practices is to protect the patient from the public. It is particularly important that cases of the childhood communicable diseases be protected from contact with persons harboring hemolytic streptococci in their respiratory passages, for such contacts may lead to the serious complications of otitis media, mastoiditis, or pneumonia.

There is, however, no justification for failure to report all cases of communicable diseases. All such cases should be meticulously reported to the health department, for frequently it is only through the summation of these individual reports that the health department can be the first to recognize an epidemic and start the machinery in motion to eradicate it. There are a few diseases, notably smallpox, in which it is imperative that the movements of all persons who have been exposed be limited for a period of time at least equal to the longest usual incubation period.

Isolation and quarantine have failed to control communicable diseases because frequently it is impractical or impossible to achieve these measures in the home, and because of the presence of carriers and missed cases. Furthermore, many patients are most infectious during the prodromal period when there are few symptoms and before the diagnosis usually can be made. These facts have caused us to turn our interests to the use of preventive vaccines.

Preventive Vaccines

The universal use of appropriate preventive vaccines gives us hope of establishing community-wide immunity for many diseases, for where there are no susceptibles it is impossible for a disease to gain a foothold or an epidemic to get started. Thus smallpox could be completely eliminated from this country. Fortunately, the history of preventive biologicals in this country has been consistently one of improving products at a lowering cost. However, it is well to know the indications and limitations of all such available products and to understand the *relative degree* of protection afforded, and its duration. In addition, it is necessary to know what age groups, and in some instances what occupational groups, need specific protection against pertinent infections. In general, the preventive biologicals are most effective when used to control person-to-person contact diseases.

Sanitation

In most instances diseases having animal reservoirs and insect vectors, the intestinal infections, and particularly those spread by water, food, and milk, are better controlled by sanitation. Sanitary disposal of excreta, sanitary water, and sanitary milk and food supplies for the entire community have resulted in a miraculous degree of control of typhoid fever, and in some instances of the dysenteries.

Specific Therapy

Specific prompt therapy by physicians who recognize the disease early and administer the appropriate specific biological, chemical, drug, or antibiotic is now helping to control a large number of diseases. Physicians have at their disposal excellent well-equipped public health laboratories to assist in making specific diagnoses by isolation of the organisms involved. This is now more important than ever before. In order for the physician to select the most appropriate therapeutic weapon, it is absolutely essential that the causative organism be isolated or evidence of its presence demonstrated by sero-

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logical methods. However, it is fallacious to believe that there is now a specific cure for all of the communicable diseases. Unfortunately, there are still many diseases for which no specific therapy is known.

Health Education

To make these control measures effective, all persons of a community must intelligently comply with such isolation and quarantine measures as are necessary. All cases of communicable diseases must be reported, and the carriers and missed cases must be sought out and treated. The entire community must desire good sanitary environment and the benefits of the protections afforded by specific preventive vaccines. Furthermore, all individuals must seek the services of their physician promptly when they become ill. This desire on the part of the entire community can be fostered and achieved only through continued health education, which is not something to be tossed lightly to one health educator or nurse, but is a continuing job for all physicians, educators, and health workers.

It is quite impossible for this report to touch on every communicable disease, but it can deal more specifically with some groups and certain individual diseases.

Childhood Diseases

In recent years multiple antigen vaccines have been found very effective, so that now combinations such as diphtheria and tetanus toxoid, or diphtheria, tetanus, and whooping cough vaccines are available and are recommended. The immunological response of newborn babies is rather poor, but all babies should be vaccinated early for smallpox and whooping cough, and perhaps the multiple antigen vaccine can be safely administered at the age of 4 months. The diphtheria toxoid booster dose should be given the child before he enters school, and another tetanus toxoid injection should be given at any time he sustains a deep puncture wound or dirty laceration.

For chickenpox, there is no specific preventive biological or treatment. For measles, immune globulin can greatly modify or prevent the infection, but its routine use in children over 3 years of age is not recommended. Though scarlet fever is well remembered as a very severe and serious infection in the past, at the present time its severity appears markedly decreased. There is available an efficient preventive biological, scarlet fever toxoid, which can be obtained in a purified form. It can be given in three doses to children at about the age of 6 months. However, all facts considered, the importance of routine scarlet fever immunization seems doubtful. Epidemic diarrhea of the newborn is a disease for which there is no specific vaccine, preventive biological, or therapy. Continuous, strict aseptic nursery practice appears to be the best preventive measure now available.

Other Bacterial Diseases

Rheumatic fever is probably caused by various strains of Group A hemolytic streptococci, and the only preventive measure now known is the use of prophylactic doses of sulfadiazine. For plague there is a good vaccine, but sanitation—the "building out" of rats and their fleas—offers the best long-term preventive measure. Typhoid vaccine is effective but does not offer absolute protection. Again, sanitation is the best means of preventing the disease, although there still exist in this country many communities with endemic foci where vaccination is necessary. Tularemia has a widespread reservoir in animals and other rodents. Dogs and cats have been the cause of this infection in man, and it is well known that ticks and biting flies may convey this disease. Even water in flowing streams repeatedly has been reported by the Rocky Mountain Laboratory of the United States Public Health Service to be infected with tularemia organisms. Tuberculosis shows some added signs of reduction as a result of the photofluorographic case-finding technique. It is necessary, however, to prove the diagnosis of all suspected cases by the laboratory demonstration of the tubercle bacillus. In June 1948 the first International Congress on Bacillus Calmette-Guerin in Paris reported ten million vaccinations with B.C.G. during the past 25 years. The Congress further recommended the vaccination of all newborn, and of all frequently exposed groups such as doctors, nurses, and medical students. The diarrhea infections of *Salmonella* and *Shigella* origin recently have been studied extensively in Texas by Dr. James Watt. He has shown that by controlling flies on a community-wide basis the incidence of *Shigella* infections was reduced by 30 to 50 per cent. Again it is a sanitation job to remove and eliminate all man-made fly-breeding places.

Rickettsial Diseases

Murine typhus fever is found in southeastern United States, Rocky Mountain spotted fever all over this country, rickettsialpox in New York City at the present time, and Q fever in California and Texas. These diseases all have animal reservoirs, and except for Q fever they have known arthropod vectors. The epidemiology of Q fever is not yet complete, but indications are strong that the infection may be conveyed by unpasteurized milk from both cattle and goats. For these rickettsial infections there are effective vaccines and specific therapy. The acute cases are most effectively treated by either Duomycin or Chloromycetin, the latter also being effective in the treatment of acute typhoid fever. Ultimately these two drugs may be shown to be effective in numerous other bacterial diseases. However, the control of the rickettsial infections is mostly a sanitation job through the inspection of animals for these diseases.

Virus Diseases

For influenza, there is now a quite effective vaccine offering good protection against the more common strains. The duration of this protection is short, probably not exceeding one year. Against the common cold there is no protective vaccine or specific therapy. In the case of poliomyelitis all the vaccines to date have not proven sufficiently innocuous to warrant their use. Convalescent serum, various drugs, and antibiotics have no specific value in the treatment of acute or chronic cases. The role of flies in the transmission of poliomyelitis is as yet not completely determined, but it is the general belief that they do *not* represent the principal mechanism

of transmission during an epidemic. Encephalitis of the St. Louis type and of the equine types are accidental infections in man from natural host reservoirs, birds and animals, and transmitted by arthropod vectors. Mosquitoes, chicken mites, and lice have been shown to be naturally infected vectors for these diseases.

In a further effort to assist in controlling communicable diseases the Public Health Service established the Communicable Disease Center in Atlanta, Georgia, in 1946. The Center has sought particularly to render service in those areas where State and local authorities are hardest pressed or where they have no facilities for effective control. In 1947 the Communicable Disease Center was designated by the Public Health Service as its official office for emergency epidemic and disaster relief. Therefore, the Communicable Disease Center stands ready at present to assist States and local communities through States, by:

1. Giving in-service type of training courses for sanitarians and engineers in insect and rodent control, and general sanitation.
2. Lending expert personnel such as engineers, nurses, veterinarians, scientists, sanitarians and physicians for insect and rodent control, and for general sanitation programs.
3. Lending equipment, particularly for typhus and malaria control programs, and also for epidemic and disaster aid.
4. Lending training aids, filmstrips, and films covering rodent and insect control, general sanitation, and specific communicable disease diagnosis, prevention, and treatment. These visual aids are especially designed for use at the professional level.
5. Training of already employed technical and professional laboratory personnel by short refresher courses in the laboratory diagnosis of the various communicable diseases.
6. Furnishing laboratory reference diagnostic services for unusual specimens or for those presenting a diagnostic problem.
7. Supplying consultation services in all fields of communicable disease control, sanitation, engineering, nursing, laboratory procedures, epidemiology, and preventive immunization.

Summary

1. Effective control of the communicable diseases is a matter of teamwork for all members of a community.

2. People must want to prevent illness, and a tremendous job in health education must be done.

3. A big sanitation job remains to be accomplished in the prevention of many diseases.

4. Improved reporting with an all-out effort to find and treat the carriers and atypical cases is essential.

5. Specific therapy, based on early diagnosis confirmed by intelligent laboratory work, is absolutely necessary.

6. Community-wide immunization of infants and frequently exposed groups is the only method to prevent some diseases from gaining a foothold.

7. The Communicable Disease Center of the United States Public Health Service is now rendering much assistance to States and local communities (through the States) in many phases of their communicable disease control programs.

8. Communicable diseases can be effectively controlled by the efficient and efficacious use of all these measures on a community-wide basis, with the elimination of much needless suffering and with marked reductions in morbidity and mortality.

American College Health Association News

Two hundred and thirty colleges and universities are members of the American College Health Association. Membership dues for 1949 have been paid by 96 per cent of the member institutions. What about the delinquent four per cent? The secretary hopes to hear from these institutions soon.

Membership promotion is possible by nominations made by present members. Membership application blanks can be obtained from the office of the secretary.

Because of changes in the personnel of college health services, it is difficult to keep records up to date. The secretary requests that any changes in staff be reported to her office.

* * * * *

Ohio University is in need of an experienced clinician, preferably interested in chest work. The position has attractive features, including new building. Address Dr. E. H. Hudson, Director of Health Service, Ohio University, Athens, Ohio.

A Clinical Evaluation of Aqueous Thephorin. A New Parenteral Antihistaminic Agent

A. L. Maietta, M.D.*

Boston, Massachusetts

In recent years, a large number of reports have appeared in the literature attesting the therapeutic value of antihistaminic preparations as palliatives for certain allergic disorders. Commonly, these agents have been administered by the oral route. Friedlaender and Friedlaender[1] recognized that the response to this type of medication varied with different individuals depending greatly upon (1) the location and intensity of the allergic manifestation; (2) differences upon gastrointestinal absorption; and (3) the amount of histamine which may differ in some allergic disorders or the amount of histamine release which, in certain instances, is too great to be controlled adequately by the usual non-toxic oral doses. They also noted that, in ambulatory patients, inordinate oral doses, when required to control the symptoms, were undesirable because of frequent and pronounced side effects and that, oftentimes, even large oral doses failed to produce symptomatic relief.

Parenteral antihistaminic therapy should be considered when (1) patients are unable to take antihistaminics orally; (2) excessive oral doses, always potentially hazardous because of their pronounced side reactions, are required to alleviate the symptoms; (3) smaller doses, administered parenterally and at less frequent intervals, can control more adequately the allergic manifestation; and (4) it is deemed advisable to interchange or combine small oral and parenteral doses.

Further, according to Yonkman and Mohr,[2] parenteral antihistaminic therapy appears to be indicated in "epinephrine-fast" cases. These authors believe that the asthmatic subject becomes epinephrine-fast because of the predominance of histamine, produced or released by the administration of epinephrine. The injection of an antihistaminic agent should inhibit clinically the edema-promoting action of histamine and should also nullify contraction of the bronchial mucosa by histamine. Thus, the bronchodilating effect of epinephrine is allowed to predominate with attending dramatic relief to the gasping "epinephrine-fast" asthmatic. Successive doses of epinephrine, if indicated, should relax the bronchi in the presence of specific antihistaminic therapy.

For some time, an aqueous solution of Thephorin,† containing 25 mg. of Thephorin per cc., has been made available to us for clinical study. This preparation has been employed parenterally, as a palliative and a prophylactic, in 65 allergic patients.

In the study, there were 28 males and 37 females. Fifty-six patients were over, while nine were under 100 pounds. Their ages ranged from 4 to 63 years.

Aqueous Thephorin has been administered subcutaneously, intramuscularly, and intravenously, once or twice daily as indicated. Subcutaneously, in doses of 25 mg., it usually caused a slight burning or stinging sensation which occasionally was followed by a minimum amount of induration and a small erythematous flare at the site of injection. Deposited intramuscularly in doses of 15 or 25 mg., it caused a momentary feeling of burning and stinging followed by local muscle soreness. These local post-injection symptoms were inconsequential and disappeared within a relatively short time. Intravenous injections were reserved for the very serious cases. All intravenous injections were diluted with equal parts of sterile normal saline solution and were administered slowly in about 10 seconds. For adults, the initial intravenous dose was 12.5 mg. (½ cc.). If the first intravenous medication was well tolerated, successive doses were 12.5, 15, 20, or 25 mg., as the clinical symptoms dictated. Intravenous injections were unaccompanied by any local effects.

Side reactions were surprisingly few when the parenteral route alone was employed. Drowsiness was the only toxic manifestation encountered. It usually was slight, did not induce sleep, and lasted from a few minutes to a half hour. However, when Thephorin was administered by both the parenteral and oral routes, side reactions were more frequent. Drowsiness was the most prominent; while jitteriness, insomnia, dizziness, numbness, and fatigue also were noted occasionally. These symptoms were relatively mild and disappeared in from one to three hours.

Results

Bronchial Asthma. In contradistinction to previous reports[3] that antihistaminics, administered orally, have not been strikingly helpful in asthma, the antiasthmatic action of parenteral Thephorin is marked. In our experience, its efficacy is distinct. Its palliative action, though constantly beneficial, may vary, one dose occasionally producing a more pronounced response than another. It was employed as an adjunct to other accepted forms of therapy and, oftentimes, appeared to possess a synergistic action with epinephrine. When bronchodilator drugs failed to produce the desired result, parenteral Thephorin seemed to enhance their effect in subsequent administrations. Aqueous Thephorin was given

†Supplied by Hoffman-La Roche, Inc., Nutley, N. J.

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parenterally with favorable results to 17 patients with bronchial asthma, four of whom were in status asthmaticus. These patients received ephedrine orally and epinephrine, both aqueous 1:1000 and in oil. In addition, the four patients with status asthmaticus were given aminophyllin intravenously or rectally by suppository. With such a regimen, their symptoms were only briefly or partially relieved. The administration of parenteral Thephorin, either intramuscularly or intravenously, produced an amelioration of their symptomatology. Within one hour, the wheeze and dyspnea lessened; the patient became quieter; and the vital capacity, as determined by the McKesson-Scott apparatus, generally was increased. Subsequently, such valuable antiasthmatic drugs as ephedrine, epinephrine, and aminophyllin, became more effective and, not infrequently, the interval between their administration could be lengthened. The dose of parenteral Thephorin was repeated once or twice daily, as indicated.

Case Report. D. D., a male of 42, had asthma and eczema for 39 years and, in latter years, hay fever during August and September. He exhibited positive skin tests to egg, house dust, bacterial vaccine of the Catarrhalis type, birch, orchard grass, redtop, timothy, and ragweed. Smoke, sharp odors, paint fumes, dusts, sudden changes in temperature, windy days, dampness, and prolonged rain aggravated his asthmatic state. Egg was eliminated from his diet and desensitization injections of house dust and vaccine were given. During four months (November 1948 to March 1949), he had four hospital admissions for severe status asthmaticus. The first three hospital stays were stormy and averaged twelve days each. Treatment consisted of ephedrine, epinephrine, both aqueous and in oil, Demerol, aminophyllin intravenously, and Isuprel and penicillin aerosols. During his last admission, he received 5 mms. of aqueous epinephrine every three or four hours, as indicated, and 1 ampul of epinephrine in oil together with an aminophyllin suppository rectally every eight hours. In addition, he was given 25 mg. of Thephorin intravenously once or twice daily. On the first and second days, one intravenous injection of Thephorin daily produced such marked amelioration that epinephrine was not required for several hours. He experienced only slight, transient drowsiness and, because his symptoms, for the time, were well controlled, enjoyed the best sleep at night that he had had in months. On the third day, the morning injection of Thephorin did not improve his symptoms very much. Six hours later, despite additional doses of epinephrine, his asthma became worse and aminophyllin was given intravenously. During the course of its administration, the patient vomited and its further injection was suspended. A few minutes later, he received 25 mg. of Thephorin intravenously and 100 mg. of Demerol. Within one hour he was improved and required no additional epinephrine until the next morning. On the fourth day, he was given another 25 mg. dose of Thephorin intravenously and, since then, his symptoms were well controlled with 1 ampul of epinephrine in oil at bedtime and an occasional injection of aqueous epinephrine during the day. On the fifth day, he was ambulatory and, on the seventh hospital day, was discharged with marked clinical improvement.

Cutaneous Allergy. The favorable influence of parenteral Thephorin on cutaneous allergic manifestations was striking. Eight patients, 5 with angioneurotic edema and urticaria, 2 with urticaria, and 1 with eczema and angioneurotic edema were benefited. Some of these patients previously had received other antihistaminics orally with only partial relief. Later, these drugs were discontinued because of pronounced side reactions.

Case Reports. N. A., a 63-year-old female, with severe angioneurotic edema and generalized urticaria of forty-eight hours duration following the ingestion of half an Anacin tablet taken for the relief of a headache was improved with 25 mg. of Thephorin intramuscularly. There was a noticeable recession of the swelling within a relatively short time. Subsequently, this favorable state was maintained with oral doses.

C. B., a 52-year-old male with a severe penicillin reaction requiring hospitalization, exhibited generalized, giant urticaria from scalp to toes and angioneurotic edema of the face, lips and eyelids. Two intramuscular injections of parenteral Thephorin daily supplemented with oral doses were sufficient to so improve his symptoms that he was discharged on the fourth hospital day.

M. M., a 32-year-old female, had eczema and angioneurotic edema for 20 years with frequent exacerbations. Elimination diets, vitamins, and calcium therapy had proved relatively ineffective. When examined, the symptoms were moderately severe. Parenteral and oral Thephorin combined with the administration of calcium gluconate and multiple vitamins produced a very satisfactory result.

Perennial Allergic Coryza. Three patients, with symptoms of perennial allergic coryza of several years duration, responded favorably to parenteral Thephorin. Objectively, they demonstrated boggy turbinates, an edematous mucous membrane, and rhinorrhea. In the past, one other antihistaminic orally afforded fair to moderate relief but had to be discontinued because of its side effects. A 25 mg. dose of Thephorin subcutaneously produced a temporary but satisfactory alleviation. For several hours thereafter, the nasal obstruction was decreased, breathing was easier, and the nasal discharge diminished greatly.

Migraine. Two patients with migraine were spectacularly relieved with parenteral Thephorin. Intravenous administration produced recovery within a few minutes; intramuscular within one hour.

Case Report. R. S., a 45-year-old male, had periodic attacks of migraine for the past 25 years. A positive family history of allergy was present, the mother having bronchial asthma and a sister hay fever and eczema. His symptoms ran the classical gamut,—scotomata, head pain, facial pallor, nausea, vomiting, retching, exhaustion, and sleep. Seconal and Gynergen afforded the best relief. Two hours usually would elapse after taking the medication before he was able to be up and about. During the last attack, as the severe headache developed, he received 12.5 mg. (½ cc.) of Thephorin intravenously. Within 12 minutes after its administration, the sequence of symptoms was disrupted and the patient made a dramatic recovery. He experienced no drowsiness and was able to resume his normal activities.

Infrequency of Constitutional Reactions. The prophylactic effect of parenteral Thephorin was demonstrated in a group of 35 ragweed-sensitive patients on pernnial treatment. Top pollen doses were given at bimonthly intervals by combining the ragweed antigen with 25 mg. (1 cc.) of aqueous Thephorin in the same subcutaneous injection which was supplemented by two double oral doses of Thephorin, a 50 mg. dose being given 20 minutes prior to the injection (preinjection oral dose) and another 50 mg. dose one hour afterwards (postinjection oral dose). The top pollen dose for 22 patients was 20,000 Coca-Noon Pollen Units and for 13 patients 10,000 pollen units. Each pollen unit contained 0.00001 mg. of total nitrogen. This group of patients received the combined antigen-antihistaminic treatment at bimonthly intervals on four occasions, a total of 140 injections. The significant observations in this study were that 34 patients (97 per cent) safely tolerated their massive pollen doses and constitutional reactions were rarely encountered despite the fact that (1) top pollen

doses were administered instead of a substantially reduced amount of antigen as is customarily done in perennial pollen therapy; (2) the interval between injections was lengthened from the usual three or four to eight to ten weeks; and (3) the amount of antigen, being given at a time when the blocking antibody titre was falling, constituted a deliberate overdose from which a systemic reaction ordinarily could be anticipated. Only one patient, whenever the top dose of 10,000 pollen units was administered, exhibited mild, delayed constitutional reactions which were adequately controlled with additional oral doses of Thephorin.

Summary and Conclusions

Aqueous Thephorin is a safe medicament and is suitable for parenteral administration. It has been given subcutaneously, intramuscularly, and intravenously. Side reactions have been negligible, slight drowsiness being the outstanding symptom. Aqueous Thephorin, administered parenterally in doses of 12.5 to 25 mg., has been employed as a palliative and a prophylactic. In a number of allergic manifestations, including bronchial asthma, status asthmaticus, eczema, urticaria, angioneurotic edema, perennial allergic coryza, and migraine, it has exerted a distinctly beneficial influence. Oftentimes, in bronchial asthma it apparently behaved as a synergist, enhancing the action of epinephrine. As a prophylactic agent, it has been combined in the same injection with massive doses of pollen antigen and, in 97 per cent of the cases, has prevented the anticipated constitutional reaction which ordinarily may follow a deliberate overdose of pollen extract. When indicated, the parenteral route can be interchanged or combined effectively with small oral doses. Parenteral Thephorin appears to be a valuable adjunct in the treatment of allergic diseases.

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The Effect of Adenosine-5-Monophosphate on Pruritus

Antonio Rottino, M.D.*

New York, New York

The following observation was made by chance while treating patients suffering from Hodgkin's disease with adenosine-5-monophosphate,** namely, complete subsidence or amelioration of pruritus. The drug was administered during the week of December 3, 1948, to a group of Hodgkin's disease patients to see whether it might possibly increase their physical energy.† In this respect no results ensued, but two patients—the only ones in the group suffering from pruritus—reported casually that this symptom had completely disappeared on the sixth and seventh days of therapy. Approximately thirty days after discontinuance of adenylic acid therapy both patients suffered a recurrence of the pruritus; after renewed administration of the drug the pruritus once more disappeared. Following this experience many other patients having pruritus due to various causes were treated by the author and by colleagues.‡

To date, June 24, 1949, forty-four patients have been treated. In five instances the pruritus was associated with diabetes mellitus (four cases under insulin control and one as yet untreated), in ten instances with Hodgkin's disease, in one with carcinoma of the ovary, in one with Duhring's disease, in one with hair dye sensitivity, in one with obstructive jaundice. Twenty-two cases were idiopathic and three occurred postpartum. In the majority of cases the pruritus was severe, of long standing, and had been previously subjected to numerous therapies. Distribution of pruritus was in 23 instances generalized, in 16 instances the genitals (vulva, scrotum, anus) were involved, and in four instances the extremities.

*From the Hodgkin's Disease Research Laboratory (supported by grants from the National Cancer Institute of the U. S. Public Health Service, American Cancer Society, and the Damon Runyon Memorial Fund), and the Department of Medicine, St. Vincent's Hospital, New York.

**The preparation used was "My-B-Den," made and supplied by Ernst Bischoff Company, Inc.

†This was done at the suggestion of Prof. Kurt Stern, Polytechnic Institute of Brooklyn.

‡Drs. Lloyd Craver, A. Susinno, Richard Kennedy, O. Canizares, A. Shapiro, J. Corr, W. Stankard, and F. Jost, to whom I express my appreciation.

Results

Results were negative for 8 patients and positive for 36. There were 14 cases of complete subsidence, 15 of marked improvement, 5 of moderate improvement and 2 of mild improvement. To date the pruritus has returned in ten instances; five of these patients have been retreated and have responded favorably to the second series of medications, four with complete relief and one with moderate relief.

Administration

The most favorable and uniform results were obtained from intramuscular injection: 20 mg. dissolved in water, five doses given at hourly intervals for three consecutive days. As a rule the response, whether mild, moderate or complete, occurred in one or two days. Response usually occurred by the end of three days if at all, although there were several exceptions to this. No toxic symptoms were noted when the drug was given as outlined above. We are now experimenting with oral administration; this promises to be successful but data are not yet sufficient to include in this report.

Conclusions

The results would appear to indicate that the number of patients reacting favorably to the drug is too large to be the result of mere chance. Of interest also is the fact that in some instances the pruritus not only disappeared but the skin became softer and less dry. The effect on the skin had been noted earlier [1] but not expanded upon. Sufficient time has not yet elapsed to present a complete evaluation, but the results to date seem sufficiently dramatic to warrant presenting this preliminary report. Not only is there promise of a valuable therapeutic agent; the light which further study may throw on heretofore unsuspected mechanisms related to dermatological conditions in general and to the symptom of pruritus in particular seems to be equally important. From available data it would appear that an altered phosphorylation mechanism related to deficiency of adenylic acid may be responsible for pruritus and for certain forms of skin disease.

[1] Carlstrom, B., and Olle Lövgren: Acta Medica 110, 230 (1942).

The JOURNAL LANCET

Official Journal of the American College Health Association, Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology

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Editorial

THE ROLE OF HEALTH COUNCILS IN MINNESOTA

Minnesotans are becoming more and more aware of the important role local health councils can play in promoting better health. We seem to have reached the stage in public health where further progress calls for understanding and participation by informed lay citizens. Although we have succeeded in reducing the infant and maternal mortality rate to one of the lowest in the country, reducing the tuberculosis death rate, and almost eradicating several other communicable diseases, we still have many health needs that are not adequately met. For example, Minnesota is lagging behind many other states in providing for the health of its rural people. Almost two million of our population have no full-time local health services. Many villages are without sewage treatment plants. Too many people are having needless accidents. Too many industrial workers are subjected to unnecessary health hazards. Cancer and heart disease and diabetes are claiming too many young adults.

Professional health workers realize that they themselves are helpless in meeting these problems and similar ones unless they have the interest, understanding, and cooperation of all citizens. Most of these problems require concerted local action to bring about desirable changes. Serving on a community health council is an excellent way for citizens to learn how to gain better health for themselves, their families, and their communities.

A stimulus to the creation of health councils in Minnesota was provided during the past eighteen months by the Health Days held in many centers throughout the state. These Health Days were occasions when hundreds of people gathered to discuss their community health problems and listen to talks by experts in many health fields. The Health Day idea originated with the women's auxiliary of the Southwestern Minnesota Medical Society. Auxiliary and medical society members in all parts of Minnesota worked with the State Department of Health and with a great many other official and voluntary health agencies in promoting these meetings. Many citizens who participated in Health Days felt that some permanent organization should be set up for finding and solving community health problems. This is just what a health council does. It may justly be said that the health councils so far organized in Minnesota developed directly out of the activities of Health Days.

What Is a Health Council?

A health council can be defined very simply as a group of people who have joined together to improve commu-

nity health conditions. The main requirement for a successful council is a group of citizens who are willing to work in order to find, study, and solve their local health problems. Health councils may be organized on a state, district, county, village, or neighborhood basis.

Who Belongs to a Health Council?

Membership in a health council will vary from place to place, depending upon local conditions. However, it is generally agreed that it is wise to have the council as inclusive as possible, with broad representation from all community groups. Any citizen interested in the promotion of health in the county is eligible for membership in two of the county-wide health councils now operating in Minnesota. Any organization similarly interested may elect one representative to serve as a member of the council.

Usually a community health council consists of representatives from professional groups such as medical, dental, nursing, engineering, welfare, and teaching; from voluntary organizations interested in health, such as the Red Cross, Christmas Seal organization, and Boy Scouts; from churches; from civic groups such as Chambers of Commerce and service clubs; agricultural, business, and labor groups; city and county officials; and citizens-at-large.

What Does a Health Council Do?

The purpose of a health council is to get citizens to work together in improving health conditions in their area. Generally speaking, a health council does the following:

1. Coordinates health programs in the community.
2. Finds and studies health needs in the community.
3. Stimulates community interest and develops understanding of public health problems.
4. Undertakes health projects and programs in the community.

The work of a health council is usually done through committees. A currently active county-wide health council may serve as an illustration.

Activities of the Nobles County Health Council

The Sanitation committee, whose chairman is a farmer active in the Farmers Union, recognized the need for improving sanitary conditions in public eating places in the county. The committee members got in touch with owners and employees in food and drink establishments and talked over some of their problems. Both the foodhandlers and the people in the community expressed an interest in a short course on food handling. The committee secured Mr. Harold S. Adams, director of the Division of Hotel and Resort Inspection, Minnesota Department of Health, to teach the course. About 175 foodhandlers in the county attended and all of them showed a real interest in improving conditions in their own places of business.

The Mental Health committee, under the chairmanship of the judge of Probate Court, has been working on a program for the prevention and elimination of some mental health problems. This committee has enlisted the help of Dr. Dale B. Harris, professor in the Institute of Child Welfare, University of Minnesota, to conduct a mental hygiene survey of the school children in Nobles county. The committee feels that the survey will give some idea of the extent of emotional difficulties in school children in their county and will develop a general awareness of this problem. The council hopes that the county in the near future will employ a person specially trained in mental health who will work with parents, teachers, children, physicians, welfare workers, and others in reducing this problem.

The School Health committee, led by a physician, has made an extensive inventory of existing school health services in the county. The aim of this committee is to find the weak spots in school health programs and to encourage improvements.

Organization of a Health Council

There are no set rules that must be followed in the organization of a health council. Here again, methods are best determined by local circumstances. What is best for one community may not serve another. The one requisite of a successful council is that citizens want the organization and are willing to work together in it. Frequently, interest is limited at first to a small nucleus of people. They in turn have to interpret the idea to others. Most health councils elect a chairman, vice-chairman, and secretary as well as three to seven directors. This group serves as a board of directors or an executive or interim committee. They carry on business and make any necessary decisions between meetings of the whole council, which are usually held at least three times a year. Meanwhile the various committees carry on their work, which is determined by the chief health needs in the community. Members of the council work on committees handling problems in which they have a particular interest. The Cottonwood County Health Council has committees on Sanitation, Safety, Mental Health, Public Relations, School Health, Rural Health, and Finance.

People often have to learn how to work together on health council committees. In the beginning it is usually best for committees to undertake short-term projects that they can actually do something about, in order that workers will reap some reward for their effort. As the group matures, it can undertake more difficult and time-consuming projects.

Both laymen and professional health workers should be included in each committee. Experience has shown that such joint groups can work out community problems in accordance with the best public health standards.

The Role of the Physician

The physician is looked upon by all as the health leader in the community. To be successful a health council must have the approval and active cooperation of the medical profession. The role of the physician, however, is not in dictating policies and practices, but rather in working with non-medical people in a way that enables the whole group to discover real problems, un-

derstand the facts underlying those problems, and work out methods for solving them.

Resources of Local Councils

Various state and national organizations are interested in the development of local health councils, and are willing to help them.

Plans are under way in Minnesota for the creation of a State Health Council. The original group will consist of representatives from 27 agencies that have a vital interest in public health. One of the main functions of the state health council will be to assist the development of local councils. Plans call for an executive director and staff. Member organizations will be asked to contribute to the support of the council. The Minnesota State Medical Society has already set aside funds to contribute its share toward this project. Personnel from the Minnesota State Department of Health will give whatever help they can.

Then there is the National Health Council with headquarters at 1790 Broadway, New York City. This group, organized in 1921, now includes 23 national health organizations in its membership. Its main concerns for the immediate future are to stimulate the promotion of new state and local health councils, to cooperate with existing ones to secure more efficient health services, and recruit and train personnel for health council work.

It is hoped that health councils will develop in many more places in our state.

News Items

South Dakota

Deans of university medical schools from seven states met in Deadwood July 14-15 to discuss problems of medical education. In addition to Dr. Slaughter, dean of the University of South Dakota, the state was represented by Dr. W. L. Hard and Dr. R. L. Ferguson. Othere states represented were North Dakota, Nebraska, Kansas, Colorado, Missouri and Iowa. Invitations to attend the meeting were extended physicians at Belle Fourche, Newell, Sanator, Custer, Hot Springs, Edgemont, Spearfish, Lead, Deadwood and Sturgis.

Dr. Warren R. Anderson, formerly of Cambridge, Minnesota, is now associated with Dr. Will Donahoe, Sioux Falls, in the treatment of children's diseases.

Dr. Anderson is a 1942 graduate of the University of Minnesota Medical School and took his internship at Minneapolis General Hospital. He was commissioned into the medical corps in 1943 and was discharged in 1946 following 18 months in the European theatre. He then took residency training in pediatrics and children's diseases at Minneapolis General Hospital, University of Minnesota Hospital and St. Barnabas Hospital in Minneapolis.

Pennington county commissioners have appointed Dr. F. A. Rudolph to the post of county coroner until the next general county elections. Dr. Rudolph, who is county physician, was appointed to fill the position just vacated by Dr. D. L. Kegaries, who resigned recently.

Garretson now has another doctor. Dr. E. Suckow, M.D., arrived there in July with his family, and is getting ready to start practice of general medicine and surgery. Dr. Suckow is a graduate of the medical school of Northwestern University in Chicago, and interned at Wesley Memorial Hospital in Chicago. He has also done considerable research work at the Northwestern Medical School and was an instructor in physiology for the medical students at the college.

North Dakota

Dr. Wayne E. LeBien recently joined the pediatric staff of the Fargo Clinic.

Dr. LeBien, born and raised at McHenry, North Dakota, attended North Dakota University and is a graduate of N.D.A.C. with a degree in pharmacy. He received his M.D. from the University of Minnesota Medical School, interning at two Minneapolis hospitals, Lutheran Deaconess and Minneapolis General. Dr. LeBien also did postgraduate work and was a teaching fellow in pediatrics at Minneapolis General Hospital.

Newest Bismarck surgeon is Dr. Myron W. Goughnour, who joined the staff of the Henderson and Orr clinic in Bismarck in July. The new physician will specialize in surgery in his practice in Bismarck.

Thirty-six applicants have been licensed to practice medicine and surgery in North Dakota following the completion of examinations given in Grand Forks by the state board of medical examiners. Tests were completed Friday, according to Dr. C. J. Glaspel of Grafton, secretary of the board.

Newly-licensed doctors, their home address and the town in which they intend to locate include: Richard H. Leigh of Grand Forks; Louis F. Pine of Burlington, Vt., Devils Lake; E. Madison Paine of Grand Lodge, Mich., Minot; Wellington B. Huntley of Ann Arbor, Mich., Minot; John A. Beall of Galion, Ohio, Jamestown; William G. Ensign of Defiance, Ohio, Minot; and Myron W. Goughnour of Hazelton, Bismarck.

Other successful applicants are Charles B. Porter of Baltimore, Md., who plans to locate in Grand Forks; Clifford F. Gryte of Hoople, Diedrich L. Oltman of Hampton, Ill., Minot; Gordon A. Salnes of Overly; Fredrick N. Walsh of Winnipeg, Man., Drayton; James DeVicardy of Edmonton, Alberta; David Hoehn of Chattanooga, Tenn., Sharon; Gilbert S. Wheeler of Winnipeg, Man., Portland; Amandus C. Kohlmeier of Winnipeg, Man.; Julian Tosky of Transcona, Canada, Larimore, and Duane W. Nagle of Marion, Enderlin.

Completing the list of new doctors with their home addresses and intended locations, are Harry A. Ohrt of

Mileston, Sask.; William P. Teevens of Wawota, Sask., Minot; George L. Loeb of San Haven; William E. Barker of Lewvan, Sask., Wesley E. Levi of Zeeland, Linton; George M. Hart of Elgin, Ill., Minot; William S. Pollard of Winnipeg, Devils Lake; John T. Boyle of Newark, N. J., Garrison; Bernice F. Andrews of Chattanooga, Tenn., Sharon; Roy E. Eldred of Crosby,

Minnesota

On June 4, 1949, Dr. Vernon L. Hart presented a paper entitled "Recognition and Treatment of Congenital Dislocation of the Hip During the First Six Months of Life" at the Harvard Medical School. He also presented a paper on the same subject at the American Medical Association meeting in Atlantic City. A motion picture by Dr. Hart and his associate, Dr. Wesley H. Burnham, was presented each day of the meeting in the Scientific Exhibit.

Dr. J. Dewey Bisgaard, Omaha, president of the Central Surgical Society of the United States and Canada, and professor of surgery at the University of Nebraska, was the principal speaker at the annual banquet meeting of the St. Louis County and Range Medical Society on Tuesday, June 28, at 6:30 P.M. at Burntside Lodge. Dr. Jack P. Grahek, Ely, was in charge of arrangements and served as toastmaster for the banquet.

Dr. Robert N. Barr was appointed deputy executive officer of the Minnesota health department in July by the state board of health meeting at the University of Minnesota.

Dr. M. B. Hesdorffer was named director of the health and medical care division of the Community Chest and Council of Hennepin county.

Dr. Hesdorffer is medical consultant for the Veterans' administration insurance service program in this region. He replaces Dr. D. A. Dukelow, who left March 1 to become medical consultant on health and fitness for the American Medical Association in Chicago.

Dr. H. B. Clark was again named as prize-winner of the 1949 American Physicians Art Association exhibit at the American Medical Association's convention in Atlantic City, N. J., June 12-15. Dr. Clark's painting, entitled "Sunflower Farm" is a scene taken from a farm near St. Cloud.

New officers of the Minnesota Surgical Society, elected during the society's meeting at Duluth, are Dr. M. G. Gillespie, Duluth, secretary-treasurer; Dr. L. W. Johnsrud, Hibbing, vice-president, and Dr. Gordon MacRae, Duluth, president.

Dr. Owen H. Wangensteen, chairman of the surgery deparment of the University of Minnesota medical school, was named president of the Minnesota Medical Foundation. Dr. George N. Aagaard, director of the university's postgraduate medical education, was chosen secretary-treasurer.

Obituaries

Dr. Herbert H. Hodgson, a practicing physician of Crookston for 50 years, died Sunday, July 3, in St. Paul. The end came for the long-time Crookston physician while he and his wife were visiting his daughter, Dr. Jane Quattlebaum of St. Paul. He was 79 years old.

Dr. Herbert A. Burns, 66, chief of the tuberculosis control unit of the division of state institutions, died July 8 at Veterans Hospital.

Dr. Burns had devoted his entire professional career to the fight against tuberculosis and was a nationally-recognized authority on the disease. He had been on leave of absence from his official duties since July 1.

Dr. James H. Bentson, 31, former St. Paulite and a fellow at the Mayo Clinic in Rochester, died June 28 in New York City after a brief illness.

A native of St. Paul, Dr. Bentson was educated at St. Paul Academy and the University of Minnesota, from which he was graduated in 1942. Since his graduation he had lived in Rochester. He was on a vacation in New York at the time of his death.

Dr. Wilhelm S. Anderson, 73, Northfield, retired physician, died June 26 following a heart attack. He was 73 years old.

After graduating from St. Olaf College and the University of Minnesota in 1903, Dr. Anderson practiced in Warren, Minneapolis and Grand Forks, N. D. He served in the medical corps during World War I, and was at Ft. Snelling from 1921 until his retirement in 1944.

Dr. Lloyd G. Dack, 59, St. Paul, died Saturday, July 9. He had been in the practice of medicine in St. Paul 21 years. Dr. Dack was born in Stanton, Minn., attended Carleton college and obtained his medical degree at the University of Minnesota.

Dr. William Henry Rumpf, 82, a physician and surgeon in Faribault for nearly a half century, died Sunday, June 26. Dr. Rumpf came to Faribault in 1902, after being connected with Northwestern University medical school ten years. He was educated at the University of Berlin and at Yale.

Dr. E. W. Benham, a prominent Mankato physician for many years, died June 19 in Compton, Calif. Dr. Benham was a member of the Mankato Clinic. He retired from 47 years of practice five years ago.

Dr. Robert Fieck, 24, Plainview, who had been practicing in Plainview since last fall, died June 19.

Book Reviews

Aesculapius Comes to the Colonies, by MAURICE BAER GORDON, M.D., Ventnor, Pa.: Ventnor Publishers, Inc., 520 pp., illustrated, $10, 1949.

There are those who hold that to be a good doctor one must be more than merely a good doctor. In this country one might well be, also, a good American. Dr. Gordon makes it easy to be both. The beginnings of medicine in this country, the debt that the profession owes to the Scottish schools of medicine and surgery, the impingement on and involvement with the wars, patriots, personalities, politics and principles of the infant nation are set down interestingly and instructively. Shot through the rich and well printed volume are legends and facts, quotations and opinions, fee schedules and case histories that paint a vivid picture of medical life and labors in each of the original colonies. Not since the Private Diary of Wm. Byrd, first governor of Virginia, has there been such a comprehensive, photographic presentation of the daily duties and responsibilities of the privileged and advantaged among their hardy and primitive neighbors.

Not the least profitable reading in this voluminous compendium is the story of the evolution of medical education and the crystallizing of medical ethics and, in the light of recent dicta handed down at Atlantic City, this makes for more than ordinarily interesting reading for the physician. Here is medical history in the rough, personalized, broken down into sources colony by colony, disease by disease, event by event, doctor by doctor. As an evidence of how far American medicine has come and yet, also, how far it had come by the time of the founding fathers, the book is a valuable accomplishment and a substantial contribution to medical recording of events and development.

M. W.

Handbook of Communicable Diseases, by FRANKLIN H. TOP, M.D. Second edition, St. Louis: The C. V. Mosby Company; 992 pp. with 93 text illustrations and 13 color plates, 1947.

The first edition of this book was well received. A review of the second edition reveals that the author has been fortunate in securing as collaborators men of great eminence in the field of infectious diseases. With their help numerous revisions have been made. Three chapters have been completely rewritten; namely, those on Influenza, Malaria and Rickettsial Diseases. To indicate the scope of this review, it is sufficient to list the 14 new chapters which were added; namely, Coccidioidomycosis, Rheumatic Fever, Primary Atypical Pneumonia, Epidemic Diarrhea of the Newborn, Infectious Hepatitis, Chancroid, Lymphogranuloma Venereum, Granuloma Inguinale, Ophthalmia Neonatorum, Epidemic Keratoconjunctivitis, Leptospiral Jaundice, Ringworm of the Scalp, Trachoma, and Infectious Mononucleosis. Concerning most of the diseases there are sections on definition, infectious causative agent, immunity, epidemiology, pathogenesis, pathology, clinical features, clinical types, complications, differential diagnosis, prognosis, treatment, symptomatic treatment, specific treatment, treatment of complications, and prevention. This reference and text book is highly recommended for both practitioner and student.

A. V. S.

Roentgen Diagnosis of the Extremities and Spine, by ALBERT D. FERGUSON, M.D. Second edition, New York: Paul B. Hoeber, Inc., 1949.

The new edition of this authoritative text and atlas represents a considerable expansion of the old edition in regard particularly to the diagnosis of bone tumors. Further editions have also been made in regard to the spine. The illustrations are numerous and well reproduced. This book represents essentially an atlas since the amount of text devoted to each lesion is relatively small.

L. G. R.

Classified Advertisements

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The JOURNAL LANCET

Minneapolis, Minnesota
September, 1949

Vol. LXIX, No. 9
New Series

Saddle Block Anesthesia in Obstetrics*

G. Wilson Hunter, M.D.,† D. F. Nelson, M.D.,† and C. B. Darner, M.D.†
Fargo, North Dakota

It has been said again and again that the ideal obstetrical analgesic agent has yet to be popularized. The search for it continues. Over the years a considerable experience has been gained with a number of methods including the Gwathmey technique, using ether and oil rectally; rectal instillations of paraldehyde; and pentobarbitol with scopolamine. Later the combination of demerol and scopolamine was begun and is still in use. During this entire period 1 per cent novocaine local anesthesia was employed on selected cases and in 1944 continuous caudal analgesia was introduced and used extensively until June, 1948, when "saddle block" was begun.

Today the safety and popularity of this agent is well established and it is believed that experience with a carefully observed series may be worth reporting. "Saddle block" or minimal dosage low spinal should be distinguished from surgical spinal anesthesia as it is generally thought of.

Local infiltration, undoubtedly the safest anesthesia when accepted by patient, has been used exclusively in our deliveries at a foundling home for a number of years. It is not, however, acceptable to the vast number of private patients. Hypnotism and the Read method, used in a few selected cases, was found to be impractical because it is so time-consuming. Sodium pentothal has been useful for rapid induction in some cases but there must be no delay in delivering the baby. It is the writers' impression that low dosage spinal anesthesia with heavy nupercaine is the most satisfactory analgesic and anesthetic agent available. It may be used alone in rapidly progressing labors or with preliminary demerol and scopolamine in patients dilating slowly.

Material and Methods

A total of 304 cases is included in the study. Of these 106 were primiparae and 198 multiparae. During this nine-month period 679 patients were delivered. We are using "saddle block" in approximately 65 per cent of our present cases (Table 1).

The fetal mortality is in no way connected with the anesthesia. The anesthesia was repeated in 8 cases because of the wearing off of the anesthetic effect or unsatisfactory initial induction. Manual removal of the placenta was carried out in four instances following delivery because of excessive bleeding and delay in separation. In no instance was there as much as 500 cc. of hemorrhage.

The technique of induction is simple. The patient, supported by a nurse, is placed on the edge of the delivery or labor bed in a sitting position and the area of spinal puncture prepared with tincture of zephiran. A 22-gauge short bevel spinal needle is used and 2.5 to 5 mgm. of heavy nupercaine is introduced with the loss of as little spinal fluid as possible. With experience it is possible to note the appearance of spinal fluid and apply the syringe without loss of as much as a drop. After the injection the patient is kept in a sitting position for 20 to 30 seconds, then placed in a recumbent position with the head supported by a high pillow. Repeated blood pressure readings are taken throughout the period of anesthesia and especially during the first 20

*Presented at the Devils Lake District Medical Meeting, Devils Lake, North Dakota, April 6, 1949.

†From the Department of Obstetrics and Gynecology, Fargo Clinic and St. Luke's Hospital.

minutes. Care is taken not to make the injection during a uterine contraction.

Observations

Complete relief was obtained in 280 cases. Twenty-four patients, most of whom were early in our series, obtained partial relief. There was a drop in blood pressure to 90/60 or below in 21 cases. Fifty-four complained of headache lasting from one to nine days. Only six of these were considered severe. The balance were transient and lasted only one or two days when the patient was in the upright position. Eight patients complained of backache, a symptom which disappeared by the time of discharge. One hundred eighty-four of these patients voided spontaneously. Sixty required catheterization one or more times during the first 24 hours. Thirty-two required catheterization after the first 24-hour period. All were voiding spontaneously within six days. There were no instances of residual paralysis.

Table 1

Infant mortality

Stillbirths—3 (2 abruptio placentae,1 hypertensive toxemia)

Neonatal deaths—2 (both congenital anomalies incompatible with life).

Maternal mortality—0.

Labor was terminated in the following manner:

Primiparae: 106		Multiparae: 198	
Low forceps	94	Low forceps	146
Spontaneous	4	Spontaneous	46
Mid-forceps	7	Mid-forceps	3
Breech Extraction	1	Low cervical cesarean section	2
		Breech extraction	1

Number of infants requiring resuscitation: 8.

All of these 8 patients had had demerol and scopolamine prior to the saddle block.

Discussion

Patients were selected on the basis of their desire for this type of anesthesia. Those with a systolic blood pressure below 100 were excluded. The initial drop in blood pressure below 100/70 was treated in most instances with neosynephrine .25 cc. given intramuscularly. A dose of 1 cc. oenythol was used in some cases but it was not felt to be as satisfactory a drug in sustaining the pressure. In addition to the medication, the legs were raised and oxygen inhalations given to combat drop in pressure. The trend towards mild shock can usually be anticipated by the subjective symptoms of the patient, including faintness, air hunger, and nausea. In no instance was the blood pressure drop sustained to a degree which would cause alarm.

Many writers have felt that the size of the spinal needle and the loss of spinal fluid were factors in the causation of post-spinal headache. Some urge early assumption of the sitting position in bed while others suggest the recumbent position for the first 24 hours. Schmitz and Baba [1] suggest assumption of the near upright position from the day of delivery as a measure to prevent headaches. A large fluid intake is urged by one group, pituitary extract and nicotinic acid intravenous injections by others. Rogers [2] used caffeine sodium benzoate intravenously for headaches. We have noted that as our facility improved we have had fewer headaches. It is suggested that patients remain in a recumbent position for at least eighteen hours after delivery. In a few instances it was felt that nicotinic acid intravenously has been of benefit. Most of the headaches are controlled with the routine capsule of codeine sulfate gr. ss and ASA compound gr. x which is used for after-pains.

Anderson [3] notes "a well being shown by women under spinal block; their condition is entirely different from the morbid condition commonly observed when prolonged labor is terminated under general anesthesia. Immediate improvement is often noted; nourishment is retained and strength rapidly regained . . ."

It is not felt that the incidence of catheterization is any higher in this series than it is in the patients on whom general anesthesia is used.

The period of anesthesia lasted from one to four hours. Perineal anesthesia lasts one or more hours longer than abdominal. Pains may come through on one side without detracting materially from the anesthetic result.

The patients on whom only a partial success was attained were for the most part satisfied and stated merely that they felt some distress at delivery. There were four patients who expressed complete dissatisfaction with this method of analgesia.

The greatest objection to "saddle block" in obstetrics seems to be the markedly increased operative procedures which are entailed. With the perineum anesthetized, these patients have no desire to bear down. In studying the figures, it will be noted that the incidence of mid-forceps is not increased but it is merely the figures for low forceps which are higher. It can be seen that a moderate number of multiparae do expel their babies spontaneously. It is felt that low forceps delivery in the hands of trained obstetricians adds nothing to the morbidity or mortality of either infants or mothers.

The impression gained by attending nurses and doctors that labor is shortened for patients under "regional block" is not true. Nicodemus,[5] reporting a study of patients under continuous caudal in 1945, maintained that labor was not shorter but actually somewhat longer. It seemed shorter, however, to comfortably progressing patients and to those in attendance.

The following contraindications are suggested:

1. It is not suitable for individuals of a certain temperament. A definite number of patients desire to be asleep.
2. Diseases of the central nervous system or spine.
3. Initial systolic blood pressure below 100 mm. of mercury.

The following advantages of low dosage spinal anesthesia are emphasized:

1. The ease of administration. In using caudal we found that we were unable to introduce the anesthetic in 1 out of 10 cases. With "saddle block" there have been no patients on whom we could not introduce the needle.

2. The fact that the effect is immediate. This is particularly satisfying in rapidly progressing cases.
3. The safety for mother in the presence of upper respiratory infection, vomiting, or other conditions contraindicating general anesthesia. The absence of danger of aspirating vomitus. Inasmuch as many obstetric patients come to delivery with food in their stomachs, this is a very real danger.
4. The increased relaxation of pelvic musculature enables delivery.
5. The absence of need for accessory anesthesia for delivery and repair.
6. The absence of detrimental effect on infant. Decreased incidence of asphyxia and narcotization. In cases where demerol and scopolamine were used as preliminary medications it had largely worn off by the time of delivery under "saddle block."
7. The fact that it does not affect contractions of the uterus.
8. The gratifying reaction of the patient when she is able to be awake and hear the first cry of her baby.
9. The suitability for prematures because of the perineal relaxation and absence of narcotization.
10. The suitability for patients with cardiac and pulmonary complications. It spares the mother the second, most taxing stage of labor.

Greenhill[4] continues to call attention to the dangers of high spinal anesthesia. We have great respect for his judgment, but it should be emphasized that small dosage low spinal should not be directly compared with surgical spinal as it is given routinely. In his discussion of "saddle block" in the 1948 Year Book he quotes articles written by Hansen in 1937, Gaster in 1944, Franken in 1934, and several others, all of which were studies made before the advent of minimal dosage spinal anesthesia in obstetrics so that they are hardly a fair basis for comparison.

Summary

1. Three-hundred-four cases of "saddle block" anesthesia are presented.

2. Complete anesthesia and satisfaction were obtained in 280 patients. Twenty-four patients had only partial relief.

3. The complications were minor. They consisted of headaches, backaches, and urinary retention and hypotension.

4. Operative obstetrics in the form of outlet forceps deliveries is increased.

5. The term "saddle block" instead of "spinal" should be used in discussing this procedure with patients.

6. Minimal dosage low spinal anesthesia in obstetrics using heavy nupercaine is a safe and effective procedure.

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UNIVERSITY OF MINNESOTA SCIENTISTS OFFER HOPE FOR PARALYSIS PATIENTS

Many chronic neurologic patients—some who have been paralyzed for up to 20 years—can be rehabilitated, can walk again or even go back to work, according to two University of Minnesota medical scientists. Dr. A. B. Baker, professor of neurology, and Dr. Joe R. Brown, clinical associate professor of psychiatry and neurology, are the authors of a new Veterans Administration pamphlet (No. 10-29) describing a program of retraining for persons afflicted with neurologic disabilities.

"It is a principle of modern medical practice that all patients have assets as well as liabilities," Dr. Magnuson, chief medical director of the VA, wrote. "But what are the assets of a chronic neurologic patient who has been hospitalized for 3, 5, 10, or even 20 years, so paralyzed that he cannot turn over in bed? This man, obviously, has a strong will to live and enduring physical capacity to survive. Beyond this, he frequently has been looked upon as largely helpless and hopeless, a liability to himself, his family and the hospital."

Drs. Baker and Brown concluded that there is a great need for establishment of such programs, which in the first year alone can save more than $1,000,000 in one hospital.

Urological Complications in Obstetrical Practice

B. C. Corbus, Jr., M.D.
Fargo, North Dakota

PYELITIS of pregnancy, more properly designated *pyelonephritis,* occurs in 2 per cent of all women carrying children and is the commonest cause of significant fever in the second and third trimesters. In order to institute adequate treatment of the disease it is necessary to comprehend fully, first, the physiology of the urinary tract in pregnancy and, second, the pattern assumed by the actual pathology. Several factors present themselves which, when analyzed, make one wonder why upper urinary tract infection in the pregnant female is actually not far more frequent than it is.

Reviewing the mechanism of the physiological hydronephrosis of pregnancy, the changes may be divided into (1) those affecting the kidney, and (2) those affecting the ureter.

In the first instance, a uniform dilation of the minor, major calices, infundibular and pelvic portions of the collecting system may be noted. Regarding the ureter, a generalized dilatation occurs predisposing to kinks, tortuosity, and lateral displacement. Definite gross changes are present on the right side in nearly all cases but in only 66 per cent is the left ureter involved.

Authorities agree that four principal alterations occur within the smooth muscle of the ureteral wall itself:

1. A loss of muscular tonus (atony) of the upper two-thirds with
2. Softening
3. Hypertrophy of the external longitudinal muscle fibers (sheath of Waldemyer).
4. Generalized increased ureteral vascularity (elsewhere attendant in pregnancy) with a resulting partial obstruction or, more rarely, complete stricture formation.

The actual cause of the physiological hydronephrosis of pregnancy is unknown. Experimental evidence points to the existence of two influences which probably have a synergistic effect on the upper urinary tract. Placental hormone is known to have a dilating action on ureteral smooth muscle but why should it be selective and act only on the upper two-thirds of the duct? Mechanical obstruction by the fetal head, formerly thought to be wholly responsible, undoubtedly contributes to the end result. Reasons given why the left ureter is not dilated as often as the right are solely mechanical—the cushioning effect of the sigmoid colon plus the fact that the ever-enlarging uterus has a tendency to incline to the right.

It is a urological maxim that wherever significant urinary stasis is encountered infection ultimately occurs. As a prominent authority states, a paradoxical situation is present whereby uterine atony retains the fetus *in situ,* whereas ureteral atony invites infection, impairs drainage, and retards recovery.

Let us now examine more in detail the pathological aspect of an already significantly altered urinary tract. The bacteriological agent in nine-tenths of the cases belongs to the coliform group, namely: Eschericia coli, staphylococcus, streptococcus, proteus and, rarely, tuberculosis or gonococcus may also be present. Pre-existing urinary tract bacteria may account for 6 to 10 per cent of the cases. Over 80 per cent of the coliform infections are thought to be derived from the intimate lymphatic anastomosis between the right kidney and the ascending colon. Extrinsic portals of entry involve the shortness of the female urethra and careless hygiene attending bowel action.

What morbid anatomy is encountered in the pyelonephritis of pregnancy? The pathological chain of events includes first of all a ureteritis, then pyelitis, then a pyelonephritis. Infected hydronephroses progress to pyonephroses. Perirenal inflammation leads to perinephritic abscess and peri-ureteral inflammation, when healed, produces annular fibrosis with resulting stricture formation. All of this emphasizes the absolute necessity of *early, adequate treatment* in this type of individual.

The diagnosis of acute urinary infection in the pregnant woman is not difficult, especially when it has become a disseminated urinary sepsis. Fortunately, with the advent of the chemotherapeutic agents this is encountered far less frequently then formerly. High fever, sweats, rapid pulse with frequency, and severe dysuria, plus exquisite costovertebral angle tenderness, paint the picture only too clearly. Vaginal examination often reveals a tender bladder base and, frequently, a palpable, extremely tender ureter may be present. With adequate treatment this condition may last anywhere from ten days to three weeks and carries a mortality of about 2 per cent. More difficult to recognize is the subacute or afebrile type of infection which so commonly characterizes the B. coli urinary infection in the nonpregnant female. However, it is equally important to recognize the milder types of this disease in order to avoid the more serious complications; i. e., frank urinary sepsis. So whenever a pregnant patient with fever or painful urination is encountered, complete urological investigation is indicated. The following points are necessary in evaluating such cases:

1. Microscopic and cultural examination of a catheterized urine specimen.
2. Cystoscopy and intravenous pyelograms if symptoms persist for longer than two weeks despite chemotherapy. Commonest abnormal finding in the pyelogram is the demonstration of a ureteral kink requiring catheter drainage. This may be con-

tinued for a period of four to seven days, dependent upon the subsiding of symptoms. A practical method of keeping a ureteral catheter in place is to splint it with adhesive tape to an indwelling Foley urethral catheter.

3. When ample fluids and complete antibiotic therapy together with instrumental drainage produce no relief of symptoms, most obstetrical authorities agree that a termination of the pregnancy is imperative as a life-saving measure. Often, however, patients with severe infections in the second trimester may be successfully carried to term with continued antibiotic medication.

A word about chemotherapy is timely at this point. Sulfa compounds advocated earlier have not been found the drug of choice. Penicillin and streptomycin have been used widely and work well in combination. The individual bacteriological agent involved must be recovered by urine culture to determine the optimum therapeutic agent. Recently a prominent urologist has had outstanding success in the treatment of intractable low grade (B. coli) urinary infections by the combinative use of sulfasuxidine and mandelic acid or more recently streptomycin. The sulfasuxidine sterilizes the bowel by eradicating the B. coli at its source, and the mandelic acid and streptomycin sterilize the urinary tract as a secondary measure. Results: a success of 96 per cent has been achieved in chronic cases of long standing.

Postpartum care of these individuals is equally important. A history of pyelitis of pregnancy necessitates urological investigation following delivery or prior to the next pregnancy. A workable routine for the above is as follows:

1. Catheterized urine specimen is to be taken each month while continuing medication. If symptoms no longer persist and the urine is culture-free, medication may be withdrawn.
2. If persistent infection exists, cystoscopy and pyelograms are necessary.
3. If hydroureter remains after three months, ureteral dilation should be carried out.

Patients of this type should be clinically well and culturally negative a minimum of six months before another pregnancy is begun.

It is to be noted in conclusion that 50 per cent of pyelitis of pregnancy cases have had previous trouble and that in fully half, the infection may be expected to recur at some future time.

Due to prevalent factor of urinary stasis in the pregnant state, *renal* or *ureteral calculi* are twice as frequent as in the nonpregnant state. Operative removal is rarely necessary and then only when obstruction is complete.

Cystitis may be aggravated by the increased vascularity attending gestation in the first and second trimesters. During the last trimester the bladder may become irritable because of encroachment on its base by the enlarging uterus. Bladder sedatives may be tried but usually are of little value.

Hematuria may occur from any of the causes in the nonpregnant state but in the main from the following:

1. Vesical varicosities,
2. Sulfonamid crystalluria,
3. Subclinical bacteriological inflammation (B. coli)

Urological investigation is advocated immediately in the presence of unexplained urinary bleeding.

Can patients with a single kidney have children? The answer is yes with four exceptions:

1. Patients having had a tuberculous kidney removed less than three years before are not advised to become pregnant.
2. A kidney removed because of malignant disease constitutes a contra-indication to pregnancy.
3. Pyelonephritis necessitating termination of gestation and not responding to treatment contra-indicates pregnancy.
4. Finally, patients with polycystic kidney disease possess insufficient renal reserve to tolerate pregnancy successfully.

Summary and Conclusions

1. The mechanism of physiological hydronephrosis is reviewed.

2. The significance of the pathological physiology and morbid anatomy of pyelonephritis of pregnancy is elaborated upon.

3. Diagnosis and treatment are given in detail.

4. Chemotherapeutic agents discussed and a rationale for postpartum management offered.

5. The lesser urological complications of pregnancy are taken up in order of their importance.

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Sixty-Second Annual Meeting
Minot, North Dakota, May 14-17, 1949

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Proceedings of the House of Delegates of the NORTH DAKOTA STATE MEDICAL ASSOCIATION

First Session, Saturday, May 14, 1949

The First Session of the House of Delegates of the North Dakota State Medical Association was called to order by Acting Speaker of the House, Dr. A. E. Spear, at 8:30 P.M. in the Skyline Room of the Clarence Parker Hotel, Minot, North Dakota, May 14, 1949.

Speaker Spears: "Before proceeding with the business of the Sixty-second Annual Meeting of the House of Delegates of the North Dakota State Medical Association, I can not but call your attention to the unforeseen and unfortunate circumstance which made it necessary that I act as your presiding officer tonight. You elected Dr. Nachtwey of Dickinson as your Speaker, and I am only acting in his stead. I will do my best, and I ask your cooperation.

"May we hear from the Chairman of the Credentials Committee, Dr. A. C. Fortney?"

Dr. A. C. Fortney, Chairman of the Committee on Credentials, announced that eighteen delegates had presented their credentials and were qualified.

The Secretary, Dr. Sedlak, called the roll and the following responded: Drs. A. C. Fortney, Fargo; E. J. Beithon, Wahpeton; E. M. Haugrud, alternate, Fargo; G. W. Toomey, Devils Lake; T. Q. Benson, Grand Forks; George Waldren, Cavalier; R. W. Vance, Grand Forks; A. K. Johnson, alternate, Williston; D. J. Halliday, Kenmare; A. R. Sorenson, Minot; M. G. Flath, Stanley; W. H. Gilsdorf, Valley City; R. B. Radl, Bismarck; M. S. Jacobson, Elgin; V. D. Fergusson, alternate, Edgeley; R. W. Rodgers, Dickinson; P. G. Arzt, Jamestown; H. A. LaFleur, alternate, Mayville; R. F. Gilliland, Carrington.

The Speaker declared a quorum present.

Minutes of 1948 Meeting Approved

On motion of Dr. Halliday, seconded by Dr. Radl, and carried, the reading of the minutes of the 1948 session as published and circulated in the September, 1948 issue of the Journal-Lancet were dispensed with and the minutes adopted.

Introduction of President

The Speaker introduced the President, Dr. W. A. Liebeler, who welcomed the Delegates to the convention and delivered the following address:

"I am very grateful for your courtesy in giving me this opportunity to address you. I assure you it will be brief. I am very grateful that you have accepted me so far as President of the Association. I am also very glad that you have turned out in such fine manner. I am quite anxious that this meeting be a successful one, one of the most successful meetings in our sixty-two years of existence. As anyone will know who holds an office of this sort, they can not be anything but humble in accepting, and if they have accepted it without humility, they must accept humility soon afterward. If I have met with any success, rest assured I will not take any of that as my responsibility. It is the responsibility of you delegates. If there are any misgivings, I will be very glad to take the burden of such. I am very grateful to you for coming out this evening to conduct the business of this session. I assure you that your deliberations and conclusions will be my conclusions. I know you will do everything properly. I know you are as serious about this as I am. I thank you in advance for what you will do here this evening."

The Speaker then referred of the President to the Reference Committee on Reports of the President, Secretary, Executive Secretary, and special committees.

Report of Secretary

Dr. O. A. Sedlak, Secretary, presented the following report, as prepared in the handbook, which was referred to the Reference Committee on Reports of the President, Secretary, Executive Secretary, and Special Committees:

MEMBERSHIP: The total membership for 1948 was 361. Of this number 356 paid their annual dues and 5 were Honorary Members. Seven members died during the past year and 18 of those who paid dues in 1947 did not pay their 1948 dues. It is very gratifying to know that 34 new members were admitted to the Association during this past year.

Table 1 shows the annual membership for the past eight years. You will note that in 1946, the membership was at its lowest, there being 335 members in the Association. In 1948, there were 361, a gain of 26 members in the past two years. One realizes, of course, that there were a number of deaths and retirements during this period and that, therefore, the actual gain in new members was much greater than this figure.

Table 1
Comparison of Annual Membership

	1941	1942	1943	1944	1945	1946	1947	1948
Paid Memberships	374	366	331	318	313	322	342	356
Honorary Membs.	12	10	11	10	9	9	8	5
Dues Cancelled—								
Military Service	14	32	61	59	57	4	—	—
	400	408	403	387	379	335	350	361

Table 2 shows that the annual dues for 1949 are coming in quite promptly. The meeting is somewhat earlier than in previous years. Twenty-four new members have been admitted so far in 1949. They are included in the total of 302 paid-up memberships. A study of the records indicates that several members who are in active practice have failed to pay their current dues. The District Medical Society Secretaries and the Councillors should use every means possible to collect the dues of these delinquent members.

Table 2

	April 20 1943	1944	May 5 1945	1946	May 1 1947	1948	April 15 1949
Paid-up Members	316	304	294	305	316	320	302
Honorary Members	10	10	9	9	8	6	9
To be Honorary							4
Dues Can. Mil. Serv.	58	59	57	?	0	0	
Associate						1	1
	384	373	360	314	324	327	316

FIELD WORK: Visits to our local District Societies had to be delegated to our Executive Secretary.

Your Secretary, however, did manage to attend a special meeting in June called by the A.M.A. in regard to a proposed joint commission of the Blue Cross and Blue Shield. He also attended a district meeting of the A.M.C.P. at DesMoines, Iowa, and the national meeting at French Lick Springs, Indiana. In November, the annual meeting of the North Central Medical Conference in Minneapolis was attended by both Mr. Engebretson and myself. We also attended the annual meeting of the Secretaries, the meeting of the Public Relations Committee and the Interim Session of the A.M.A. at St. Louis. A meeting of the "Committee of 53" called by the Council of the A.M.A. to introduce to the State Medical Associations the latest A.M.A. program and to launch the educational campaign of the firm of Whitaker and Baxter, was likewise attended. In addition to these national and regional meetings, attempts were made to attend all important committee meetings of the state organization.

RECOMMENDATIONS

1. In view of the fact that the office of the Secretary of the State Association is becoming more and more important and requires more work than an elective officer can devote to the office, recommendation is made that the Office of the Executive Secretary be maintained. The importance of this office was demonstrated by the close watch the Executive Secretary kept on the Legislature and the prompt action that was taken when needed. Details are included in the report of the Executive Secretary.

2. Recommendation is also made that the report of the Executive Secretary be made the primary report of this office and that the report of the elective officer become the supplementary report.

Conclusion: Outside of a few differences of opinion, peace and harmony reigned throughout the Association in the year 1948. Most committees have been very active during the past year, and I wish to take this opportunity to thank our President, Dr. Liebeler, and the other officers of the Association, together with the members of the various committees and a goodly number of others who have given unstintingly of their time and effort to make our organization a live, working, authoritative Association.

Report of Executive Secretary

Mr. E. F. Engebretson, Executive Secretary, presented the following report as prepared in the Handbook, which was referred to the Reference Committee on Reports of the President, Secretary, Executive Secretary and Special Committees:

It is again my decided pleasure to make this report covering the activities of this office during the past year. The report will be made under separate headings, for the convenience of the House of Delegates and the reference committees which will consider this report.

1. *General*: There remains very fine harmony among the members of the State Office staff which has served your organization for the past year. The facilities housing your State Office remain very adequate.

We have had during the year a new Director of the Veterans Medical Service Division; and we feel that we are very fortunate in having obtained Mr. John Fox, who is a person of high caliber and perfectly competent to carry on this important work.

Mr. Samuel Gurke, who preceded Mr. Fox, and who was thought highly of by the members of this organization, resigned from his position to take on the position of Business Manager of the Missouri Valley Clinic, Bismarck, North Dakota.

In the Executive Secretary's office we still have with us our very able secretary, Miss Rhea McDonald. The work of the Veterans Medical Service Division has been so streamlined as to require the services of only one full-time stenographer.

One could not ask for better office equipment than we now have. It was a great relief to have the old mimeograph replaced by a new model, such authorization being given by the Council at their January meeting. The paper detail of the office is ever increasing; but we nevertheless encourage the membership to make even fuller utilization of the services we are able to provide.

2. *Meetings*: As in prior years the officers, Council and various committees appointed by President Liebeler have been active and effective.

Your Executive Secretary has attended the various meetings of the Council, such committees having to do with social and medical economics as the Committee on Medical Economics and its Sub-Committee on Prepayment Medical Care, and the Committee on Medical Education.

He has also planned for, and/or attended such programs as the Annual Conference of District Medical Society Officers; the meetings of the Medical Center Advisory Council; and of the State Board of Medical Examiners.

Again, he has had the pleasure of attending the various meetings of the Governor's State Health Planning Committee with Dr. A. E. Spear, who so ably represents this organization on that Committee.

There have been numerous general meetings held by lay groups which this office has attended, such as negotiations with the Public Welfare Board; meetings of Farm Safety Conference; the First Annual Safety Conference; the Cerebral Palsy Clinic; meetings with the nurses' organization; the Pharmaceutical Association, and the North Dakota Farmers Union.

In the regional and national field, your Executive Secretary attended the Interim Session of the House of Delegates of the A.M.A.; its meeting called by the Council on Medical Service for a discussion of Blue Cross and Blue Shield national policies; its Medical Society Executives Conference; its Conference of Secretaries and Editors of State Medical Associations; its National Public Relations Conference; and the Fifty-Three Man Committee on Public Relations which served as the groundwork for explanation and policy of the new A.M.A. National Educational Campaign.

He also attended such national and regional meetings as the NPC National Economics meeting; and again a very worth while meeting of the North Central Medical Conference.

He also visited various North Dakota District Medical Societies at meetings held in Bismarck, Dickinson, Minot, Jamestown, and Oakes; and got as far as the railroad station in the city of Devils Lake when stricken with an inexplicable malady. He regrets very much that he had at the last moment to turn down the invitation of the First District Society.

3. *Legislative Year:* The legislative year always brings additional activity to the State Office, as your Executive Secretary is the legislative representative of both the State Association and the State Board of Medical Examiners.

It is difficult to assay the effectiveness of the work of the Association in connection with legislative matters without requesting the physicians throughout the state to send copies of all legislative action letters to this office. We feel that this request would impose an undue burden upon the membership. We nevertheless very much enjoy receiving this information, as it is the only certain way of determining whether or not sufficient action is being taken. A few of the doctors have been sending such copies, and their legislative letters in every instance have been extremely persuasive. All in all, the last session of our State Legislature can be reported as a successful one in that no detrimental legislation was passed.

One of the primary themes of the session was antipathy towards all state boards and agencies having to do with the

regulation and control of various trades and professions. Shortages in the lines of certain trades and professions do exist; and the alleged improper action of one of two individual boards is credited to all.

Three different bills aimed at all of the various boards and agencies were introduced, all of which were finally defeated. Numerous other bills were introduced aiming at individual boards, such as the plumbers, electricians and hairdressers. The bill introduced for the licensure of all foreign physicians and for the conducting of examinations in any foreign language was one of the latter type.

It was the feeling of practically all legislators that the various state boards and agencies have too much power, which can be and perhaps sometimes is used in an arbitrary manner in the various trades and professions. It became perfectly apparent during the hearings on the Displaced Physicians bill and later through the newspaper coverage given the hearings, that the North Dakota State Board of Medical Examiners is one of efficient operation, high purpose, and is impartial in its operation.

4. *Finance:* In accordance with the instruction of the House of Delegates last year, the provision for the presentation of financial statements has been changed. You will find the current financial statement of the Office of the Executive Secretary and that of the office of the Veterans Medical Service Division in the supplementary report of the Council. It will be found there as approved or corrected by the Council.

The statements are handled this way so that consideration might be had of them after action taken by the Council, to whom the Office of the Executive Secretary is directly responsible in matters of expenditure.

You will note in the statement of items chargeable to the Executive Secretary's Office, that there are a number of absolutely necessary expenditures which are not budgeted. As a result, the Office of the Executive Secretary still exceeds the budget for the year; although in many cases the amounts for the items actually budgeted have not been fully utilized.

It is recommended that a miscellaneous item of somewhere between $750 and $1000 be included in the budget. Salaries of the various employees are at a satisfactory level, and do not require adjustments.

It is again recommended that a fund and an adequate amount be set aside for the payment of the necessary meals of doctors attending statewide meetings covering the business of their office or committees. As a method of holding the group together between afternoon and evening sessions, such a policy is of practical merit.

5. *Woman's Auxiliary:* The Woman's Auxiliary continues to grow and prosper. It has had an active year under the presidency of Mrs. W. F. Baillie. It performed well in connection with this year's legislative undertakings; and it is recommended that a resolution of thanks be communicated to that organization. It is believed that as the years go on, increasingly important work may be undertaken by the Woman's Auxiliary.

6. *Annual Session*: Your Executive Secretary wishes to express his appreciation to the members and committeemen of the Northwest District Medical Society, with whom he has worked in connection with the 1949 meeting.

The list of exhibitors supporting the Annual Meeting continues to grow, till we now have eleven more exhibitors than we had at the 1947 meeting. Without their financial support this meeting would be impossible. Members are urged to visit these exhibits whenever intermissions are held, and show their appreciation to the exhibitors and their representatives.

7. Your Executive Secretary wishes to express his personal appreciation to all with whom he has had occasion to work during the last year. It is his impression that the Association is becoming more democratic in that more and more of the members have been taking an active interest in one, several or all phases of its program.

E. F. ENGEBRETSON, Executive Secretary

Report of the Treasurer

Dr. E. J. Larson, Treasurer, presented his report as published in the Handbook:

Balance on hand, May 1, 1948			$ 9,646.52
RECEIPTS:			
Receipts from dues		$14,172.50	
Interest on bonds		112.50	14,285.00
Total receipts			$23,931.52
DISBURSEMENTS:			
Checks No. 550 to No. 558, inclusive:			
6-19-48 State Medical Assn.,			
Office Exec. Secretary		$2,500.00	
Mrs. R. B. Byrne, steno. services		150.00	
8-4-48 Dr. J. H. Moore, exp. AMA conv.		163.44	
Newberry Ins. Agency,			
treasurer's bond		25.00	
10-12-48 State Medical Assn.,			
Office Exec. Secretary		2,500.00	
1-21-49 North Cent. Med. Conf.,			
1949 dues		75.00	
State Medical Assn.,			
Office Exec. Secretary		2,500.00	
4-13-49 State Medical Assn.,			
Legislative expense		128.43	
State Medical Assn.,			
Office Exec. Secretary		335.00	
Total checks issued		$8,376.87	
Bank Exchange		1.50	8,378.37
4-15-49 Balance on hand, James River			
National Bank			$15,553.15
Bonds			4,500.00
4-15-49 Total assets			$20,053.15
Recapitulation of Bank Balance			
4-15-49 Balance, James River National Bank,			
Jamestown, N. D.			$16,016.58
Outstanding checks:			
No. 557		$128.43	
No. 558		335.00	463.43
4-15-49 Balance			$15,553.15

Report of Chairman of the Council, 1948-1949

Dr. A. D. McCannel, Chairman, presented the following report which was referred to the Reference Committee on Reports of the Council, Councillors, Delegate to the A.M.A. and Member of the Medical Center Advisory Council.

During the past year the Council of the North Dakota State Medical Association met officially four times. Three of these meetings were held in conjunction with the 1948 Annual Meeting of the North Dakota State Medical Association; and one interim meeting was held in Bismarck on January 16, 1949.

The following reports were made and action taken at the May meetings:

Meeting of the Old Council—1947-1948

Dr. Arzt, President of the Association, addressed the Council, outlining the high spots of the work of the Association for the past year, and complimenting the Council on its very fine work. Secretary O. A. Sedlak made reference to his report which was printed in full in the Handbook of the House of Delegates, announcing that there were 342 paid-up members, and 8 Honorary members. Treasurer E. J. Larson made his financial report by reference to the Treasurer's Report which was also printed in full in the Handbook.

It was moved, seconded and carried that the Council recommend a raise in dues to $50 per member for more proper financing of this Association. Included in the motion was a provision for eliminating the annual registration fee of $3.00.

It was moved, seconded and carried that Dr. A. C. Fortney be reimbursed in the sum of $96.60 for expenses incurred in attending a meeting at Chicago, April 4, 5 and 6.

After some explanatory remarks by Mr. Cohen, publisher of the Journal-Lancet, it was moved, seconded and carried, that the contract with that publication be renewed for one year.

A motion that the House of Delegates give their earnest study to a plan for the prepayment of medical care, was duly passed.

Mr. E. F. Engebretson read the financial report of the office of the Executive Secretary; and Mr. Samuel Gurke read the report of the Veterans Medical Service Division; copies of which reports follow:

ACCOUNT OF OFFICE OF EXECUTIVE SECRETARY

June 1, 1947 — April 30, 1948

(Estimated Expenses, April 30 to May 31, 1948)

		Budgeted		Unbudgeted		Total
Balance on Hand, June 1, 1947			$1,647.73		$1,504.32	$3,152.05
Income, North Dakota State Medical Association			7,500.00			
Income, Convention (1947)					50.00	
Income, Convention (1948)					1,420.00	8,970.00
			$9,147.73		$2,974.32	$12,122.05
Salary, E. F. Engebretson	$2,974.88					
Social Security withheld		$ 32.08				
Income Tax withheld		201.30				
Salary, R. McDonald	1,645.30					
Social Security withheld		19.00				
Income Tax withheld		235.70				
Income Tax Paid (withheld)	473.00					
Social Security Paid (withheld)	55.50					
Social Security Paid (matched)	55.50					
Furniture and Fixtures	770.56					
Office Supplies	338.95					
Telephone and telegraph	190.88					
Rent	275.00					
Postage	147.48					
Travel	768.05					
Express and Cartage	1.00					
Woman's Auxiliary	13.63					
Power and Light	17.75					
Convention				1,371.61		
Council	20.40					
Miscellaneous:						
Medical Economics	20.34					
Bank Service Charge	3.61					
Rental, Meeting Rooms	83.46					
Donations	5.00					
Typewriter Repair	17.36					
Dues	78.85					
Cleaning Supplies	5.66					
Cleaning	55.00					
Personal Property Tax	7.42					
Subscriptions	32.75					
Court Sentence	2.10					
Total Expended to April 30, 1948	$8,059.43			$1,371.61		$9,431.04
Balance, First National Bank			1,088.30		1,602.71	2,691.01
Estimated Expense, May	600.00					600.00
	$8,659.43		$ 488.30	$1,371.61	$1,602.71	$2,091.01

VETERANS MEDICAL SERVICE DIVISION

TRIAL BALANCE

January 1, 1947 through April 30, 1948

Veterans Administration Center	$ 6,058.44	
Medical Accounts Payable		$13,456.17
Income Fees		7,829.91
First National Bank	8,645.31	
North Dakota State Medical Association		5,000.00
*Furniture and Fixtures	1,237.16	
Old Age Benefit		5.10
Withholding Tax		55.20
Personal Property Tax	12.37	
Salaries and Wages	7,232.38	
Printing	63.53	
Postage	721.80	
*Office Supplies	1,153.21	
Rent	402.50	
Power and Light	19.37	
Telephone and Telegraph	106.98	
Miscellaneous (cleaning; bond; bulbs; keys; misc. labor; bank charge)	252.61	
Insurance—Old Age Benefit Matched	67.22	
Travel	373.50	
	$26,346.38	$26,346.38

(*$19.73 transferred from Office Supplies to Furniture and Fixtures per physical inventory of property April 6, 1948.)

The report of the auditing committee, consisting of Drs. Fawcett, Meredith and Waldschmidt, was presented, and found to be correct with one exception: Check No. 540, made out to the North Dakota State Medical Association in the amount of $2500, had been improperly endorsed, but had been cashed by the bank.

The following matters were endorsed by the Council:

1. Approval of a uniform expert testimony law, at the request of the North Dakota Society of Engineers;

2. Approval and support of the work carried on by Miss Margaret Shearon in her Shearon Legislative Medical Service; and

3. Endorsement of the North Dakota Association of Medical Record Librarians.

A request for approval by the American Association of Blood Banks for support of their program, was postponed until it might be determined whether their program might in any way conflict with similar work being done by Melvin Koons at the State Public Health Laboratory.

After considerable discussion relating to the problem of the Army Engineers Corps in securing medical practitioners for the Garrison Dam, it was moved and passed that the Association tender every possible aid in this repect.

Meeting of the New Council—1948-1949

At the first session of the new Council, Dr. A. D. McCannel was re-elected Chairman, and Dr. C. J. Glaspel was re-elected Secretary. Drs. McCannel, Waldschmidt and Sorkness were re-appointed to the Executive Committee of the Council.

The following budget for the new year was prepared and approved by the Council:

Miscellaneous travel	$1750
North Central Conference	50
Committee on Medical Economics	
Stenographer	150
Journal-Lancet	800
Salary Executive Secretary	3500
Rental	360
Lights	25
Telephone	200
Office Supplies and Postage	650
Stenographer	2100
Traveling expenses, Exec. Sec.	1000

This made a total budget of $10,585. There was no set amount for the Committee on Medical Economics nor for the Chairman of the Council, or Emergency Fund of the Council. Traveling expenses of Committee members must be approved by the Executive Committee.

Note: The material following is not properly a part of the transactions of the Council, but is included because of a recommendation passed by the House of Delegates last year. The recommendation reads as follows:

"The committee would suggest that the Executive Secretary submit a financial statement for the current year, to be added as a supplemental report for the consideration of this reference committee. In this way his report and that of the Treasurer would both be current."

Your Executive Secretary of course does submit a current report each year to the Council. It has not been in the Handbook, however, because of an unfortunate practice which we have been following.

It has been customary to include in the Handbook for the following year all of the meetings of the Council at the preceding Annual Meeting. Thus, the 1949 Handbook includes the minutes of the meeting or meetings of the Council immediately prior to the meeting of the House of Delegates. Actually, the minutes of such Council meeting or meetings should not be carried over to the following year, but should be transcribed immediately and submitted to the House of Delegates for its consideration. This would clear up a lot of poor points that now occur; for example, such statements in the Council report on its first meeting, that the Secretary or the Treasurer referred to his report "which is printed fully in the Handbook." As the situation is now handled, such reference is to a report which occurred in the Handbook one year previous.

Properly, the annual work of the Council should begin with the formulation of the new Council immediately after the closing of the House of Delegates' session, and continue through all meetings of the Council up to and including those sessions which are held immediately before the House of Delegates. If this procedure is adopted, all of the confusion will be eliminated.

* * * *

At an interim meeting of the Council held in Bismarck, January 16, 1949, Dr. Liebeler was called on to act as Chairman in the absence of Dr. McCannel.

The report of the Committee on Public Policy and Legislation relative to legislation then introduced before the 31st Session of the North Dakota Legislature, was approved.

A report of the Committee on Medical Economics was adopted. The Committee on Medical Economics was authorized as the committee to negotiate with the United Mine Workers in connection with their proposal for the medical care of miners.

The Council authorized the purchase of a new mimeograph machine for the State Office.

A letter was then read from the Stutsman County Medical Society relating to a more vital public relations program. Dr. E. J. Larson was called on, and stated that some of the younger men in the Stutsman Society felt no effort was being made to offset the propaganda against medicine.

The question came up as to whether there was some way we could put the facts before the public on the radio and in the newspapers. He suggested that the radio be utilized in explaining the position of medicine to the public.

Dr. Nierling enlarged on the theme, but then added that perhaps the A.M.A. possibly will serve the purpose, and that it may not be necessary to form an executive committee or go to extra expense; stating that perhaps we should wait to see what comes from Chicago before developing the program here.

Mr. Engebretson stated that he frankly was glad to see the resolution from the Stutsman District. He further stated that this was the first time there would be a surplus which could be put to such a purpose.

Dr. L. W. Larson stated that he thought the Association should provide the machinery, but did not believe they should jump into it in the meanwhile. He stated he was convinced there would be a very effective program outlined by the A.M.A. and placed in operation. He suggested that:

1. The Committee on Public Policy and Legislation take this job over, or that a separate committee on Public Relations be formed which could consider the local situation and determine how to supplement the A.M.A. program; and,
2. That if funds were available, that $500 should be earmarked for that purpose.

Mr. Engebretson stated that with the raise of dues, a surplus would be forthcoming of approximately $5,000 a year, for expenditure in such way as the Council and members thought fit. He stated in answer to questions that a minimum of $3,500 to $4,000 would be required for even a very modest educational campaign.

Dr. Liebeler stated that in that we do not know what the national program is going to be, that for the time being a modest amount of money ought to be allotted.

It was moved, seconded and carried, that a sum of $1,000 be allocated for an educational campaign, to be expended at the discretion of the Executive Committee of the Council.

Dr. H. B. Huntley of Kindred, state delegate to the National Committee of the American Association of Physicians and Surgeons, was called upon, and gave a very edifying report of the activities of that organization.

Dr. A. E. Spear was elected successor to the late Dr. Nachtwey as Speaker of the House of Delegates.

Unanimous approval was given to the Diabetic Detection Drive, which plan was explained by Dr. Liebeler.

Supplemental Report of the Chairman of the Council, May 14, 1949

The meeting of the Council was called to order at 4:00 P.M. by the Chairman, Dr. A. D. McCannel. A quorum was present.

Dr. McCannel welcomed the members of the Council to Minot.

The minutes of the meetings of the Council since the last Annual Meeting were read and approved.

Dr. W. A. Liebeler, President of the Association, addressed the Council, expressing his appreciation of the fine work done by the Council during the past year, and his personal appreciation for the aid given him by the Council.

Dr. O. A. Sedlak, Secretary, made reference to his report which is printed in full in the Handbook of the House of Delegates, stating that in his opinion the membership for the present year would be equal or in excess of that accomplished during the year 1948. He stated further that he would again like to stress the importance of maintaining the Office of the Executive Secretary, stating that he was sure no doctor could devote as much time as the office demands at the present time.

In the absence of the Treasurer, Dr. E. J. Larson, Dr. Sorkness made the financial report of the Treasurer, by reference to the Treasurer's Report in the Handbook.

The Executive Secretary was called upon to give his report and read a detailed account of the financial status of the Office of the Executive Secretary. Both the Financial Report of the Treasurer and the Office of the Executive Secretary were submitted to the Auditing Committee appointed, consisting of Dr. Meredith, Chairman, Dr. Gilsdorf and Dr. Schwinghamer, which read as follows:

Accounts of Office of Executive Secretary
June 1, 1948 - April 15, 1949

	N.D.S.M.A.	Convention	Bd. Med. Ex. License	Bd. Med. Ex. Education	N.D.S.M.A. Education	Totals
Balance on Hand, June 1, 1948	510.11	1245.68				1,755.79
Income, N.D.S.M.A.	7,835.00					
Income, Convention		725.00				
Income, Bd. Med. Exam. License			46.61			
Income, Bd. Med. Exam. Education				566.41		
Income, N.D.S.M.A. Education					128.43	9,301.45
	8,345.11	1,970.68	46.61	566.41	128.43	11,057.24
E. F. Engebretson, salary (Soc. Sec. 27.08; Inc. Tx. 114.40)	3,066.78					
R. McDonald, salary (Soc. Sec. 19.25; Inc. Tax 194.70)	1,711.05					
Soc. Sec. Pd. (withheld)	51.00					
Soc. Sec. Matched	51.00					
Income Tax Pd. (withheld)	349.20					
Furniture and Fixtures	336.54					
Office Supplies	306.35					
Telephone and Telegraph	206.95					
Rent	310.00					
Cleaning	55.00					
Postage	164.00					
Travel	803.19					
Power and Lights	12.26					
Subscriptions, Dues, Etc.	223.75					
Repair Office Equip.	12.50					
Bd. Med. Exam. License			46.61			
Bd. Med. Exam. Education				566.41		
N.D.S.M.A. Education					128.43	
Convention (1948)		889.08				
Convention (1949)		166.37				
Miscellaneous:						
50 Yr. Club	16.00					
Personal Property Tax	13.90					
Cleaning Supplies	2.98					
Express	1.88					
Flowers	31.45					
Meeting Rooms	34.76					
Woman's Auxiliary	28.07					
Bank Service Charge	3.04					
	7,791.65	1,055.45	46.61	566.41	128.43	9,588.55
	553.46	915.23				1,468.69

North Dakota State Medical Association Veterans Medical Service
TRIAL BALANCE
January 1, 1947, through May 31, 1949

	Debit	Credit
First National Bank—May 31, 1949	$ 2,483.90	
North Dakota State Medical Assn.		$5,000.00
Medical Accounts Payable		4,708.00
Veterans Administration Center	3,373.91	
Income—Contract Fees		14,657.37
Old Age Benefit (2nd quarter only)		8.50
Insurance (old age benefit paid)	119.48	
Withholding Tax (2nd quarter only)		77.60
Printing	165.83	
Salaries and wages	12,798.33	
Postage	1,100.22	
Office Supplies	1,305.65	
Travel	445.08	
Rent	772.50	
Power and Light	31.26	
Telephone and Telegraph	177.94	
Furniture and Fixtures	1,296.63	
Personal Property Tax	26.27	
Miscellaneous (cleaning, bond, light-bulb, keys, labor)	354.47	
Totals	$24,451.47	$24,451.47

The Executive Secretary also explained that the membership had grown from the time the Handbook was mimeographed to the present time. At the present time the membership is 330. He explained the growth of membership last year from that shown in the Handbook, and stated he expected the membership would grow again this year.

He commented on the $25 A.M.A. Assessments, stating that 195 had been processed through his office, with a total of $4,875 turned over to the A.M.A. He recommended that the House of Delegates pass a strong resolution asking that all members pay this assessment which is so vital to the tremendous undertaking newly assumed by the A.M.A.

The Executive Secretary stated further that he wanted to thank the members of the Council, the State Board of Medical Examiners, and the membership at large for the great amount of help given during the last legislative campaign. He stated that the problems covered were included in the report of the Committee on Public Policy and Legislation and the Committee on Displaced Physicians, both of which appear in the Handbook. He stated further it is gratifying to know that on legislative matters, help is being received not only from the Doctors but also the Auxiliary.

Motion was made and seconded that the report of the Executive Secretary be accepted and approved with the exception of that part of which was referred to the Auditing Committee.

Mr. Cohen, from the Journal-Lancet, spoke to the Council, recommending that they see fit to recommend to the House of Delegates that the contract with the Journal-Lancet be renewed for a period of two years. Discussion was had with Mr. Cohen regarding News Items in the Journal-Lancet.

The bill submitted by Dr. Moore as Delegate to the Interim Session of the American Medical Association was approved. Attention was called to the fact that bills of several officers of the Association who have attended national, regional and state meetings have not been presented and instructions were given that such officers present their bills at the following meeting of the Council.

Dr. McCannel, a member of the Executive Committee of the Council, explained to the Council that the Executive Committee authorized the expenditure of moneys necessary to bring Forest A. Harness, Ex-Congressman from Kokomo, Indiana, to the meeting. Mr. Harness was chairman of the Sub-Committee on Propaganda investigating improper expenditure of federal agencies propagandizing for national compulsory health insurance.

The Council made the following recommendations to the House of Delegates:

1. It is recommended that the House of Delegates adopt a resolution in the strongest terms against the passage of any federal measure for compulsory health insurance.
2. After a very considerable amount of discussion, it was recommended to the House of Delegates that the incoming President be advised to appoint a Public Relations Committee for the carrying on of such campaign as may be possible to supplement the Educational Campaign of the A.M.A., and that this Committee be instructed to receive authority for expenditures from the Executive Committee of the Council.
3. The Council recommended that the House of Delegates pass a resolution directed to every member of the Association impressing upon them the importance of the work undertaken by the A.M.A. in their national educational

campaign against Compulsory Health Insurance and that each member of this Association be urged most strongly to pay their assessment of $25.00 to the A.M.A.

4. The Council recommended that the House of Delegates renew their contract with the Journal-Lancet for a period of one year.

The following proposals submitted to the Council were rejected:

1. Request from the I. C. System that the North Dakota State Medical Association either enter into a contract with it for the collection of accounts of medical patients or that the North Dakota State Medical Association give the I. C. System an endorsement.
2. A request of the North American Accident Insurance Company that endorsement be given to said company for group insurance of the membership.
3. A request by the National Sales Foundation for an endorsement of its program in selling a series of articles to the various druggists in the State of North Dakota.

The Executive Secretary was instructed to communicate with the American Medical Association requesting them to provide information concerning those members of this Association who have paid their assessment directly to the American Medical Association rather than through the State Association.

He was also instructed to notify the various secretaries of the District Medical Societies that the Council recommends that for the improvement of the Journal-Lancet, all District Secretaries should co-operate with the Journal-Lancet to the utmost in reporting all local news items of interest within their district.

There was a recess during which the Auditing Committee audited the accounts of the Treasurer and the Executive Secretary.

The meeting was again called to order to receive the Auditing Committee's report. It was moved and seconded that the financial reports of the Treasurer and the Excutive Secretary be approved.

There being no further business to come before the meeting, the Council adjourned.

Archie D. McCannel, M.D.,
Chairman of the Council

REPORTS OF COUNCILLORS

First District

Eight regular meetings were held during 1948. Meetings were preceded by dinners. One meeting was a joint meeting with wives of members. The turnout was excellent, as it seems the wives were able to get their husbands to attend.

The scientific papers were as good as usual. In April, Dr. Robert Kierland of the Mayo Clinic spoke on "Dermatological Manifestations of Systemic Disease." September, 1948, Dr. O. A. Sedlak, State Secretary, and our new President, Dr. Liebeler, spoke to us. October, 1948, Dr. George Aagaard of the University of Minnesota, gave an excellent review on "Management of Hypertension." In November, 1948, Dr. George B. Logan of the Mayo Clinic spoke on "Management of Allergic Diseases of the Respiratory Tract in Children." In December, 1948, Dr. Richard Varco, Assistant Professor of Surgery at the University of Minnesota, spoke on "Surgical Management of Some of the Congenital Heart Lesions." March, 1949, Dr. R. E. Ebert, Veterans Hospital, Minneapolis, Minnesota, spoke on "Pulmonary Emphysema." February, 1949, Dr. Wallace Rasmussen of the Mayo Clinic, spoke on "Neurological Manifestations of Systemic Disease."

Attendance at the meetings was good. Members of the surrounding local societies and medical staff of the Veterans Hospital were frequent guests.

Drs. Budd Corbus, Allen Moe, Poindexter, Kaylor, LeMar, Rogers, Lewis, Driver, Hunter, and Schneider, were elected to full membership. New probationary members were Drs. John Burton, Howard Hall, Roy E. Kulland, Robert Tudor, Theodore Donat, William Wright, Dean Nelson, Lester Wold and Ahern.

Richland County Medical Society became a part of Cass County Medical Society in February, 1949. The name of the Society was changed to the First District Medical Society in March, 1949. Total paid-up members are 63, which gave the Society one more delegate. The new delegate is Dr. Beithon of Wahpeton.

The new officers elected for 1949 were: President, Dr. Charles Heilman; vice president, Dr. Earl Haugrud; secretary-treasurer, Dr. John H. Bond; board of censors, Drs. B. A. Mazur, Stephen Bacheller and William Nichols; delegates to state convention, Drs. A. C. Fortney, B. M. Urenn and E. J. Beithon; alternate delegates, Drs. Earl Haugrud and C. M. Hunter.

James F. Hanna, M.D., Councillor

Second District

The Devils Lake District Medical Society had five regular meetings in the past year, all but one of which an outside speaker was present. The meetings were interesting and well attended, and interest is running fairly high. We have, of course, had considerable bad luck in attendance from outside men because of the severe winter, but imagine other societies have had the same problem.

Since the last report this society has definitely taken on the Medical Service Plan as presented on a state-wide basis, and at the present sitting the community has been canvassed for the first time for membership. At the time this report is made out, I am not informed as to the success of the campaign to date. With talking to individuals about town who have been contacted, I would say that interest is not particularly high.

This society has lost one man, Dr. John D. Graham, from its membership through death in the past year. There have been two men who have dropped their membership and four new members. The name of Dr. W. F. Sihler has been presented by our society to the State Association in normination for honorary membership.

John C. Fawcett, M.D., Councillor

Third District

The Grand Forks District Medical Society has had a constructive year. We have sixty active and four honorary members, every doctor in our district belonging to the society. During the year eight well-attended meetings were held. Guest speakers included A. R. Burt of Winnipeg, E. M. Hammes, Jr., of St. Paul, Francis Lynch of Minneapolis, Richard Marwin of the University of North Dakota, and Ben Sommers of St. Paul.

The following officers were elected in January 1949: President, Nelson A. Youngs, Grand Forks; vice president, Ralph Mahowald, Grand Forks; secretary-treasurer, L. B. Silverman, Grand Forks; delegates to the state medical meeting, T. Q. Benson, Grand Forks; R. W. Vance, Grand Forks; George Waldren, Cavalier and R. O. Goehl, Grand Forks, alternate.

President Youngs has recently suggested that due to the uncertain conditions of the roads in January and February, the meetings in these months be eliminated and replaced by meetings in June and August. The society has favorably acted on his suggestion and it was especially approved by the members residing outside of Grand Forks. If this new plan proves successful it could be copied by other districts in the state. His program committee is formulating an all-day meeting late in June in which several phases of chest diseases will be discussed by guest speakers including Dr. W. L. Wallbank, San Haven, on Tuberculosis; Thos. Kinsella, Minneapolis, on Surgical Aspects; and Dr. Schmidt of the Mayo Clinic on Bronchoscopic Aspects. An internist and a roentgenologist will also speak. A general invitation is extended to all doctors to attend.

The officers of the Traill-Steele District Medical Society are: President, H. A. LaFleur, Mayville; vice president, R. C. Little, Mayville; secretary-treasurer, Syver Vinje, Hillsboro; delegate, T. M. Cable, Hillsboro; alternate delegate, H. A. LaFleur, Mayville.

Paid-up members for 1948 was nine, this including every doctor in the district.

Three regular meetings and one special meeting were held during the year, guest speakers being Dr. J. J. Stratte, Grand Forks, and Dr. Lester E. Wold of Fargo.

C. J. Glaspel, M.D., Councillor

Fourth District

The Northwest District Medical Society now has a membership of 63 members, there being a gain of five members during the past year.

During the past year the meetings have been held alternately at St. Joseph's Hospital and Trinity Hospital. Both have been

excellent meeting places and we have always been served good meals.

During the year nine regular meetings were held and we were privileged to have the following speakers:

In January, Dr. Gordon Kamman of St. Paul, Minnesota, talked on "Psychiatry in General Practice."

In February, Dr. Malcolm McCannel discussed "The Problems in Squint," and emphasized the advice to be given to parents when first observed in children.

At the March meeting, Mr. Harry Northam discussed "Prepayment Insurance."

In April, Dr. Kinsella of Minneapolis, Minnesota, discussed "Surgical Conditions of the Chest."

The May meeting was turned over to the delegates to the state convention who reported on the meeting held at Jamestown.

At the September meeting, Mr. Eddie Showers of Bismarck, field man for the American Red Cross, discussed "The Part of the Red Cross in the Blind Program."

At the October-November meeting, Mr. Engebretson, our Executive Secretary, and Mr. Eagles of the Blue Cross, discussed "Prepayment Insurance."

The December meeting consisted of an open discussion of prepayment insurance by the members.

The invitation by the Northwest District Medical Society to entertain the State Medical Association was accepted by the State Association. We feel that with our new hotel we should have good facilities for taking care of the meeting. We are urging as many members to come as possible as we are going to have our famous Smorgasbord at the Country Club. All plans are underway and all committees are functioning in preparation for the convention on May 16 and 17.

ARCHIE D. MCCANNEL, M.D., Councillor

Fifth District

Herewith is the Councillor's report for the Fifth District Society for the year 1948.

The membership of our society did not change during the past year. Of the eleven men in our society, nine practice in Valley City and two in Cooperstown. One of our members, Dr. A. W. Macdonald, of Valley City, had the distinction of becoming an honorary member of the State Association in 1948.

Two regular meetings of our society were held during the year. The annual meeting in January, 1948, was devoted to the election of officers, and to the discussion of medical-economic subjects. The Councillor for the District reported on the recent Council meeting held in Bismarck. Among subjects discussed at this meeting were the selection of a journal to represent the North Dakota Medical Association; Veteran's medical examination and treatment program, and State Welfare Board fees with particular relation to the recent adoption of the maximum allowance.

In November a scientific dinner meeting was held at Mercy Hospital at which Dr. Allen Moe of the Fargo Clinic gave an excellent address on the subject of recent advances in cardiovascular medicine. The classification of various types of heart diseases, and suggested methods of treatment were outlined by the use of lantern slides.

Much of the scientific program of our society is related to the discussion of clinical cases at our Hospital Staff meetings.

Officers elected for 1949 are: President, Dr. G. Christianson; vice president, Dr. Kent Westley; secretary-treasurer, Dr. C. J. Meredith; delegate, Dr. W. H. Gilsdorf; alternate, Dr. Paul Cook.

Excellent harmony and cooperation prevails in our society.

C. J. MEREDITH, M.D., Councillor

Sixth District

Four meetings have been held during the past year with an average attendance of forty. The membership in the society is sixty-three.

The various members of the society discussed "Prepayment Medical Insurance" at one meeting. Dr. M. A. Perlstein of Chicago spoke on "The Differential Diagnosis of Convulsions in Children" and also discussed drug treatment in cerebral palsy cases. Dr. M. G. Fredricks of the Department of Dermatology, Duluth Clinic, presented a paper on "Treatment of Special Interest in Common Skin Diseases." Various members of the society presented a "Symposium on Gastric and Duodenal Ulcers."

The present officers of the Sixth District are: President, T. W. Buckingham, Bismarck; vice president, C. A. Arneson, Bismarck; secretary-treasurer, C. H. Peters, Bismarck.

New members admitted during the year were Drs. Robert Cochran, Bismarck; J. M. Bahamonde, Elgin; R. D. Schoregge, Bismarck; W. R. Enders, Hazen; G. A. Dahlen, Bismarck; W. A. Craychee, Mandan; Philip Blumenthal, Mandan.

Two members, Dr. DeWitt Baer and Dr. W. M. Smith, died during the past year. Dr. A. M. Brandt has retired and moved away and has discontinued his membership. Dr. Mary Soules, now of Billings, Montana, has transferred her membership and Dr. L. B. Moyer, now of Lake Preston, South Dakota, transferred his membership. Dr. W. H. Bodenstab, Dr. Fannie D. Quain and Dr. E. P. Quain have been made honorary members of the society.

R. H. WALDSCHMIDT, M.D., Councillor

Seventh District

The Stutsman County Medical Society, which is the Seventh District Society, had eight meetings during the year 1948, and have had two thus far in 1949.

On January 27, 1949, the following officers were elected: President, Dr. John N. Elsworth; vice president, Dr. Clarence Martin; secretary-treasurer, Dr. R. D. Nierling; delegate, Dr. P. G. Arzt; alternate, Dr. T. E. Pederson; censors, Drs. George Holt, F. O. Woodward and Robert Woodward.

At this meeting a report of the meeting of the District Society Officers and the Councillors at Bismarck, January 15 and 16 was given by Drs. Larson and Nierling, who attended the meeting.

At the February 24th meeting a colored film was shown on "Anomalies of the Bile Duct."

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At the January meeting, following the election of officers a discussion on prepayment medical care was carried out, followed by a sound film on "The Role of the Gastroscope in the Diagnosis of Gastric Disease."

The next meeting was held on February 26, 1948, at which time Dr. G. Wilson Hunter of the Fargo Clinic gave an interesting paper on "Surgical Sterilization of Women, and the Medicolegal Aspects of Such," followed by a colored film on "The Anemias."

The next meeting was held on March 25th, at which time Dr. Gerrish was recommended for honorary membership in the State Association after 50 years of service in the state. A film was shown on Obstetrical Maneuvers on the Ayer Mannkin.

Another meeting was held on April 29. Discussion of the State Medical Association meeting was carried on, followed by a film on "The Problem Child."

A business meeting was held on August 26, the primary purpose of this meeting was to discuss the North Dakota Physicians Service Plan.

At the October 28th meeting a motion was made and carried that the North Dakota Physicians Service Plan be rejected by the Society, this was carried. Two reels were shown on "Cesarean Section."

At the meeting November 19, Mr. Forsyth Engebretson, Executive Secretary of the State Association, and Mr. Donald Eagles, representing the Blue Cross and the Blue Shield, were present. They presented an outline of the North Dakota Physicians Service to date. A three-reel film on Sulfanilamide Therapy was shown.

The last meeting of the year was held on December 10. The subject of propaganda against the Medical Profession was discussed. After this a resolution was adopted to combat the situation, which was to be presented to the Councillors at the January meeting.

JOSEPH SORKNESS, M.D., Councillor

Eighth District

Two meetings were held during the past year, both at La-Moure. At the first meeting in November, 1948, Mr. Don Eagles of Fargo and our Executive Secretary, Mr. E. F. Engebretson of Bismarck, were present and the discussion centered on Blue Cross and prepayment medical plans.

At the second meeting held December 9, 1948, Dr. Corbus of Fargo was the guest speaker, the subject of his paper being Urological Conditions.

F. W. Fergusson, M.D., Councillor

Ninth District

The Tri-County Medical Society held four meetings since its last report.

Dr. P. H. Woutat addressed the society at one meeting, discussing the Radiological Diagnosis of diseases of the colon.

Mr. Don Eagles discussed the North Dakota Physicians Service at another meeting. Approval of this plan was voted and payment of the enrollment fee has been made by the majority of the members.

A report on the meeting of presidents and councillors in Bismarck was made by Drs. Gilliland and Schwinghamer at a meeting held on January 25, 1949. At that meeting the A.M.A. special assessment of $25.00 was approved and all who were in attendance made their payment at that time.

Dr. C. G. Owens of New Rockford was admitted to the society during the year and the applications for memberships of Drs. Glenn W. Seibel, New Rockford, and Lowell Boyum, Harvey, were received and approved. Officers for the year are: President, Dr. W. C. Voglewede; vice president, Dr. P. A. Boyum; secretary-treasurer, Dr. D. W. Matthaei; delegate, Dr. R. F. Gilliland; alternate, Dr. C. G. Owens; councillor, Dr. E. J. Schwinghamer.

E. J. Schwinghamer, M.D., Councillor

Tenth District

The Southwest District Medical Society now has 23 members. During the past year we have gained two new members, Dr. A. J. Spanjers, who is associated with the Dickinson Clinic, Dickinson, North Dakota, and Dr. Clarence A. Bush of Beach, North Dakota. One member, Dr. Charles A. Vogl of Bowman, North Dakota, has moved to Miles City, Montana, where he is associated with the Garberson Clinic.

It is with our deepest regret that we report one of our oldest members, Dr. A. P. Nachtwey, passed away on June 28th. He had been a very active member in the local district as well as the State Medical Association, having been delegate to the A.M.A. for many years, and during 1948 was Speaker of the North Dakota House of Delegates. The society has lost a very valuable member.

During the year the society held three meetings. In March, after a dinner at the St. Charles Hotel, Dr. Howard of Miles City, Montana, presented a paper on Rh factor in pregnancy.

In October a meeting was held at which time the problem of participation in the "Blue Shield" plan was taken up. After full discussion of the problem, it was unanimously decided by those present that the District Society should go on record as supporting the North Dakota Physicians Service Plan, and that signing up of those desiring this protection should be accomplished as soon as feasible.

On January 8, 1949, after a dinner, Dr. Cartwright of Bismarck presented a paper on the problem of Amœbic Dysentery. Guests at the meeting also included Mr. Don Eagles, Secretary of the Blue Cross, and Mr. E. F. Engebretson, Executive Secretary, who discussed the problem of Blue Shield.

Response of the members of the society to the assessment by the A.M.A. of Twenty-five Dollars per member has not been too satisfactory. This may be partly due to the fact that the roads have been almost impassable during the past winter, and that it has been impossible to have personal contact with the doctors in the smaller communities. In the large centers where more active discussion by the members was possible the response was 100 per cent, but at present only about 50 per cent of the total society membership have remitted their assessment. It is our hope that this can be raised to 100 per cent.

During this spring a program of vaccination and immunization of the school children was undertaken. For those financially able to pay, it was felt that a very nominal charge should be made, but no child was refused because of inability to pay. In the district where this was carried out, all the local groups of doctors were invited to participate, and the monies so obtained deposited to the account of the District Medical Society. It is planned to use this fund to obtain guest speakers and promote other society activities.

Dr. A. R. Gilsdorf, Councillor, Tenth District, has been taking postgraduate work at the University of Minnesota for the past nine months and has therefore been out of contact with the proceedings of the society. At his request the above report is submitted.

R. W. Rodgers, M.D., Acting Councillor

REPORTS OF STANDING COMMITTEES

The following reports of the Standing Committees were referred to the Reference Committee on Reports of Standing Committees, except the Report of the Committee on Medical Economics and its Subcommittees on Prepayment Medical Care, Veterans Medical Service, and Rural Health.

Medical Education

The Committee on Medical Education of the North Dakota State Medical Association has had but one formal meeting during the past year. Your chairman, however, has kept in close touch with the progress of the University Medical Center and did co-operate with all interested organizations in carrying on the campaign for the passage of the one mill levy. Such organizations, in addition to the University Medical Center Advisory Council, include the University of North Dakota Alumni Association, the officials of the University of North Dakota, the Dean of the Medical School and the National Accrediting Agencies. He attended the January meeting of the University Medical Center Advisory Council.

The Committee on Medical Education of the North Dakota State Medical Association, meeting at Grand Forks, March 12, 1949, has reviewed the legislative action of the 31st Legislative Session dealing with the one mill levy amendment to the Constitution passed at the general election November 4, 1948.

This committee, representing the practicing physicians of the State of North Dakota, interprets these actions as follows:

1. The mill levy is interpreted as being clearly a demand of the people of North Dakota for more competent medical care in the immediate foreseeable future. With this in mind we realize that the mill levy proceeds will not be available until sometime in 1950. This would mean at least a loss of one year in carrying out the wishes of the people of North Dakota. We suggest that the Board of Higher Education explore the utilization of the present biennial appropriation for the University Medical School of 1949-1950; or that they explore the possibility of issuing tax anticipating certificates against the one mill levy in order to carry out the following expanded program.

This committee envisions two major important phases:

1. That it is imperative that the Board of Higher Education and the Administration of the University of North Dakota take immediate energetic steps to fulfill the demands of the American Association of Medical Colleges and the American Medical Association Division of Education and Hospitals. These minimum demands are set forth as follows:

The following are the changes necessary to bring the School of Medicine up to the standard required for accreditation as outlined by Dr. Anderson, Secretary of the Council on Medical Education and Hospitals of the American Medical Association and Dr. Smiley, Secretary of the Association of American Medical Colleges to Mr. John A. Page and Dr. W. F. Potter of the University.

Department of Biochemistry: This department should have the teaching services of at least two men whose full obligation should be to the Medical School and the department should receive its budget from the School of Medicine.

Department of Physiology and Pharmacology: This department, which is really two departments, should have three teachers of professorial rank (from assistant professor up) in addition to the dean.

Department of Pathology: The pathology department should have the services of two full-time or three part-time men of professorial rank and of recognized standing in the field of pathology.

Department of Bacteriology: The present staff of this department appears adequate, but additional help will be required for teaching nurses, technologists, etc.

Medical Library: A full-time librarian should be employed and given adequate secretarial help. To build up the collec-

tion of journals, monographs and textbooks will require the expenditure of about $15,000 per year for several years.

Department of Clinical Medicine: The local medical men teaching in this department should receive part-time remuneration and should be allowed a small budget for the purchase of necessary equipment and supplies required for their teaching.

The Dean's Office: An additional secretary, or typist, should be employed to take care of the voluminous correspondence involved in admissions, transfers and the like.

Someone should be appointed to serve as assistant dean to take care of the routine correspondence of the office. (The suggestion was made by Dr. Anderson that Dr. French, Dean Emeritus, might be willing to continue to handle this work.)

Department of Anatomy: The Department of Anatomy should have a full-time gross anatomist and a full-time microscopic anatomist with a third man attached to both divisions capable of adequately substituting in either in emergencies. These men should be in addition to the dean emeritus, who would devote most of his time to the work of the dean's office.

The committee has analyzed these demands and finds that they require the immediate procurement of at least ten qualified faculty members for the maintenance of a Class A accredited two year medical school.

This committee finds that housing facilities at Grand Forks are lacking and suggests that the Administration of the University begin immediately to reserve in advance adequate housing facilities for new staff members.

This committee after extensively discussing means of obtaining physicians feels that it would be proper for the Board of Higher Education to use such receipts from the one mill levy as necessary to subsidize:

1. North Dakota graduates for the two year medical school, and/or
2. To make immediately available graduate physicians for internship training; to subsidize such graduates of other schools that have finished four years of medicine to the extent of one thousand dollars per year in return for which scholarships or subsidies they would agree to intern or practice in some rural community for one year for each thousand dollars received, and that in the event of their failure to return to North Dakota said scholarship or subsidization would be refunded to the University Medical Center at an interest rate of 4 per cent per annum.

This committee suggests that the Medical Center Advisory Council and the North Dakota Hospital Association, the Administration of the University of North Dakota, and the North Dakota University Medical School co-operate and set up a division of internship training under the supervision of a full-time medical school faculty member to be selected for his knowledge of organizing and maintaining intern training programs. Such a program conceivably can co-ordinate the larger private hospitals of the state, the State Mental Hospital, the State Tubercular Hospital, the hospital at Grafton and other health facilities in the state into an integrated teaching organization that would provide not only good internship training programs within the state, but also acquaint the graduates of such system with the facilities and needs of the state of North Dakota.

In addition this committee endorses the recommendation of the Medical Center Advisory Council to the State Board of Higher Education in all respects when and if they become feasible, urging, however, that matters contained in this committee report be given primacy; said recommendations of the Medical Center Advisory Council to the State Board of Higher Education are herewith included in totem:

The Recommendations of the Medical Center Advisory Council to the State Board of Higher Education

To recognize the mandate of the people to activate the Medical Center Enactment and to make funds available through the State Board of Higher Education, the following is recommended:

1. That the present two-year Medical School at the University of North Dakota be strengthened as soon as possible so that it may obtain the unqualified approval of recognized accrediting agencies.
2. That a study of ways and means by which general medical practitioners can be made available to the people of North Dakota through scholarships, stipends, and internships. After such a study that an administrative plan be established.
3. That a study be made of means by which state-wide pathological, library, postgraduate, and psychiatric services can be made available to the people of the state.
4. That co-operation is requested with the League of Nursing Education; the State Nurses' Association, and the State Board of Nurse Examiners, in developing a School of Nursing on the collegiate level, at the University.
5. That the University offer courses leading to academic degrees for medical technologists and x-ray technicians.
6. That the State Medical Center co-operate with public and private health agencies to augment and implement an adequate health program for the people of the state of North Dakota.

Moved by Mr. George Aljets, seconded by Dr. A. D. McCannel, that the above resolutions be adopted. Motion carried.

R. E. LEIGH, M.D., Chairman

Pneumonia

The Committee on Pneumonia held no formal meetings during the current year. It is the opinion of your chairman that efforts of the committee in prior years have fairly well accomplished the job of establishing types of treatment and developing keen interest among the profession in this disease. While there did not seem to be an urgent necessity for a meeting of the committee, it is thought that the following state totals for the incidence of pneumonia, the place of treatment and kind of treatment will be of interest to the profession.

Pneumonia Cases by Month

Month	Cases
January	91
February	117
March	133
April	107
May	89
June	64
July	46
August	53
September	34
October	69
November	49
December	66
Total	918

Pneumonia Cases by Age and Sex

Age Group	Male	Female
Under 1 month	6	10
Over 1 month and under 1 year	94	82
1 to 4	91	95
5 to 9	30	19
10 to 14	10	9
15 to 19	10	4
20 to 29	36	24
30 to 39	33	10
40 to 49	34	10
50 to 59	40	10
60 to 69	36	28
70 and over	71	59
Not stated	46	21
Totals	537	381

Kind of Pneumonia

Lobar	211
Broncho	600
Other	57
Not stated	50
Total	918

Place of Treatment

Home	34
Hospital	622
Not stated	262
Total	918

Type of Treatment

Sulfa	52
Penicillin	384
Sulfa and Penicillin	46
Streptomycin and Penicillin	13
Duracillin	22
No information	382
Eskadiazine	19

Pneumonia Deaths

	1947	1948*
Broncho	93	83
Lobar	71	43
Virus, atypical	9	2
Pneumonia, unspecified	27	20
Total	200	148

*Provisional

Statistics are obviously incomplete and somewhat inconclusive. Reporting is sporadic and not complete enough in detail. Death rate 16 per cent.

O. W. JOHNSON, M.D., Chairman

Necrology and Medical History

In accordance with the traditions of our profession we pause in our usual activities to pay our respect to those of our colleagues who have left our ranks for the Great Beyond, since last we met. This we do with sincerity, marking well their accomplishments; their ethical cooperation and their great devotion to duty and our profession.

We tender our sympathy to beloved ones who mourn their loss. May they feel, as we feel, that those departed still furnish strength and inspiration to us who must still carry the burden.

WILLIAM H. WELCH

Dr. William H. Welch, 93, passed away May 11, 1948, at his home in Larimore. He was a native of Caledonia, Vermont, where he received his early education. He graduated from the Academy of Medicine of Vermont and went to the west coast as physician for a lumber concern in 1883. He returned, however, to locate at Crookston, Minnesota, where he practiced until 1889, when he moved to Larimore. Dr. Welch served as physician for the Grand Forks County Hospital for a number of years and as medical advisor for the Great Northern Railway for many years. He was a member of the Grand Forks County Medical Society and the American Medical Association. He was married to Elizabeth Morrison of Groton, Vermont, January 14, 1882. Mrs. Welch died in 1924. They had no children.

WILLIAM MELVILLE SMITH

Dr. William Melville Smith, 49, died in early June, 1948, in New York. He was a native of Olean, New York, where he obtained his early education. Later he attended the Kentucky Military School and LaFayette College in Easton, Pennsylvania. He graduated from the University of Buffalo, Medical Department, in 1924. He earned the degree of Master of Public Health in 1938, from Johns Hopkins University. Dr. Smith joined the staff of the North Dakota State Department of Health on November 26, 1945. He was appointed Acting State Health Officer following the resignation of Dr. George F. Campana. Dr. Smith served in that capacity until April 1, 1947, when he resigned to return to private practice in the city of his birth, Olean, New York. Dr. Smith is survived by Mrs. Smith and two daughters residing in Olean.

ALOYSIUS P. NACHTWEY

Dr. Aloysius P. Nachtwey, 58, passed away in St. Joseph's Hospital, Dickinson, North Dakota, June 29, 1948. He was a native of Marshfield, Wisconsin. He was one of the first four doctors to enter practice in Dickinson and had remained in his location for thirty-five years. His death was attributed to an ailment of the heart. Dr. Nachtwey was graduated from Marquette University with the class of 1912, and was licensed to practice his profession in North Dakota, January 9, 1914. Dr. Nachtwey was a man of dynamic personality and gave much time to the affairs of his profession. He had served for many years as the delegate of the North Dakota State Medical Association to the meetings of the American Medical Association and had served his first term as Speaker of the House of Delegates of the State Association, to which office he had been elected at the annual meeting in 1947. He served in World War I, as a major. At the time of his death he had been a member of the Board of Directors of the First National Bank for thirty years and held the offices of vice persident and chairman of the board. He was a member of the executive committee of the Lehigh Briquetting Company of Dickinson. He was prominent in church and fraternal circles. Dr. Nachtwey will be much missed, especially at our annual meetings. Mrs. Nachtwey survives.

DeWITT BAER

Dr. DeWitt Baer, 63, Steele, passed away November 11, 1948, enroute to a Bismarck hospital. An ailment of the heart caused his death. Dr. Baer was a native of Ashgrove, Iowa, and was left an orphan by the death of his parents when he was six years of age. He graduated from the University of Iowa in 1908. He was licensed to practice in North Dakota, January 14, 1909. Coming to North Dakota the same year he located at Driscoll and at times had practiced at Tuttle and Braddock. He later came to Steele, where he had practiced for the past 19 years. He took a prominent part in community affairs; a churchman, a Shriner, Mason, and a member of the Lions Club. Mrs. Baer died in 1943. He is survived by a daughter, a son, three grandchildren, two brothers and a sister. He was the only practicing physician in Kidder county.

GILBERT HENDRICKSON

Dr. Gilbert Hendrickson, 60, of Enderlin, passed away December 27, 1948, in a Minneapolis hospital. His illness of several months followed surgery to which he submitted in June. Dr. Hendrickson was born at Christine, North Dakota, May 4, 1888. He studied medicine at the University of Minnesota and graduated in 1914. He was licensed to practice in North Dakota July 3, 1919. He served as health officer of the city of Enderlin for many years. He was a member of the Lutheran Church. He served as a medical officer during World War I. Dr. Hendrickson was much interested in community affairs and especially in athletics for the boys of the area. He donated the land on which was built the athletic park, which bears his name as Hendrickson Field. He was a staunch supporter of the Enderlin Legion Junior baseball team. He was pleased and rewarded by living to see an Enderlin team win the state championship and go on to participate in the national tournament. Dr. Hendrickson never married. Survivors are two brothers and two sisters.

DAVID GENTHER SAMPSON

Dr. David Genther Sampson, 57, a resident of Lisbon, North Dakota, died there January 20, 1949. He was a native of Elmer, Missouri, and was educated at the University of Missouri. Dr. Sampson spent most of his professional life in government service, as a captain in World War I, and as district physician at Pedro Miguel, Canal Zone, retiring because of ill health after 29 years of service. Besides Mrs. Sampson he leaves a son, Don David; a daughter, Jan Louise, a brother and a sister.

JOHN D. GRAHAM

Dr. John D. Graham, 47, passed away in a hospital of his home city, Devils Lake, January 26, 1949. His illness was due to a condition of the heart. Dr. Graham was born in Montreal, Quebec, February 4, 1901. He took his preparatory work at Harbord School and graduated in medicine from the University of Toronto. After his internship at Western Hospital, Toronto, a year's practice in that city, a period of time devoted to special work in obstetrics, he came to Starkweather and entered practice with the Late Dr. W. C. Fawcett. In 1928 he came to Devils Lake, where he became a partner in the Lake Region Clinic. In his college days he was a famed athlete, both in football and basketball. He was an excellent swimmer. One of his hobbies was stamp collecting. Dr. Graham was active in professional and community affairs. He served as president of the Devils Lake District Medical Society, Exalted Ruler of the Elks Lodge; a member of the board of education, Kiwanis and the Knights of Columbus. Survivors are Mrs. Graham; a son, student in medicine at the State University; two daughters at home, Judy and Deidre; and a brother, Rev. James Graham of Toronto.

WALTER C. AYLEN

Dr. Walter C. Aylen, 58, died February 24, 1949, in his home city of Auburn, Washington. Dr. Aylen was a native of North Dakota and a one-time resident of Fargo. He received his college education at N.D.A.C. and at the University of North Dakota. He earned his medical degree at Nashville, Tennessee, Vanderbilt University. Dr. Aylen was a son of the late Dr. and Mrs. J. P. Aylen, known to all of the older practitioners of the state. He had practiced at Mandan before going West. He was a veteran of World War I. He was licensed in North Dakota, July 9, 1915. Survivors are Mrs. Aylen, a daughter, a son, and seven grandchildren.

EDWIN H. MAERCKLEIN

Dr. Edwin H. Maercklein, 68, Ashley, died March 7, 1949, in Fort Snelling Veterans Hospital, St. Paul. He was a graduate of the Class of 1903 from Milwaukee Medical College and was licensed to practice in North Dakota, January 14, 1904. Dr. Maercklein was one of six men, of the same name, and related, who came to North Dakota to practice medicine. For years they were located in the territory embraced by the original Southern District Medical Society, the counties of McIntosh, LaMoure, Dickey and Logan. He was a practitioner of our profession for forty years and knew the trials well of the pioneer doctor. Dr. Maercklein was a medical officer of the A.U.S. and was buried in the Fort Snelling National Cemetery. Survivors are Mrs. Maercklein, two daughters and five brothers.

T. M. MacLACHLAN

Dr. T. M. MacLachlan, 72, passed away December 28, 1948, in California, to which state he had moved after retiring from active professional life. He was a graduate of Harvard University, in the class of 1900, and was licensed to practice in

North Dakota two years later. He was a resident of Bismarck for many years and for a time was a member of the Sixth District Medical Society.

P. F. RICE

Dr. P. F. Rice died as a result of injuries received in a car accident in Michigan. He passed away April 25, 1948. Dr. Rice graduated from Detroit Medical College in 1901 and was licensed in North Dakota July 9, 1906. He practiced for years at Solen, North Dakota.

E. S. FITZMAURICE

Dr. E. S. Fitzmaurice, 70, died in June, 1948, at Ft. Lauderdale, Florida, where he was living with a son. Mrs. Fitzmaurice passed away in North Dakota May 20, 1948, and the doctor shortly thereafter. Dr. Fitzmaurice graduated from Rush in 1902 and was licensed in North Dakota, October 23 of the same year. He held the field at Mohall and at one time was a member of the Northwest District Medical Society.

F. L. WICKS, M.D., G. M. WILLIAMSON, M.D.,
Co-Chairmen

Maternal and Child Welfare

The Committee on Maternal and Child Welfare of the North Dakota State Medical Association met in Bismarck, on January 8, 1949. The committee submitted the following recommendations:

1. At the 1948 meeting of the Committee on Maternal and Child Welfare, a request was made to gather information concerning the relationship between German measles and other virus infections during pregnancy and certain abnormalities occurring in the newborn. To emphasize the need for this information, the committee again went on record to continue its investigations to prepare factual data. A letter will be prepared to all physicians re-emphasizing the relationship between German measles and certain abnormalities with a request that all doctors doing obstetrics cooperate in this study.

2. As there has been considerable interest and several reported cases of methemoglobinemia, which is directly associated with nitrates in drinking water, Mr. Willis Van Heuvelen, chief of the Sanitation Section, Division of Laboratories, North Dakota State Department of Health, gave a resume of his investigations of over 1,000 samples of drinking water. The Committee on Maternal and Child Welfare recommended that this information be brought to the attention of the several medical societies.

3. The Committee on Maternal and Child Welfare formally discussed stillbirth rates and the causes of stillbirths. In the interest of lowering stillbirth rates, the committee recommended that this recently collected information be sent to all physicians in the state, perhaps through the State Medical Association's News Letter.

4. The Committee on Maternal and Child Welfare formally approved a pamphlet entitled "Help for the Unmarried Mother" prepared by the Division of Child Welfare of the Public Welfare Board of North Dakota.

5. The resolutions and actions of the 1948 meeting were reviewed and discussed with no formal action taken on them.

P. W. FREISE, M.D., Chairman

Cancer

The North Dakota Cancer Society has been incorporated. The By-Laws provide for a Board of Directors consisting of thriteen members, of which at least seven shall be physicians. Accordingly, and by authority of the House of Delegates' action last year, the membership of the Committee on Cancer has been increased from four to seven. This will assure adequate medical representation on the Board.

The North Dakota Cancer Society has continued its general policy of stressing lay and professional education during the past year. The annual campaign for funds during the month of April focuses the attention of the public on the cancer problem but the policy of the society is designed to extend the educational program throughout the year. This is being done through study groups, farm organizations, 4-H Clubs, exhibits at fairs and conventions, etc. Reports from all parts of the country indicate that the story of early diagnosis and adequate prompt treatment is reaching the public and the program of the American Cancer Society and its state divisions is undoubtedly responsible for this progress. The North Dakota Cancer Society has given careful consideration to methods used in other states to promote cancer control, especially through Detection Centers and mobile uints. To date the society has not deemed it wise to embark on such programs, but rather to promote the slogan, "Every Doctor's Office a Detection Center." Since the general practitioner invariably sees the cancer patient first, and therefore is primarily responsible for the early diagnosis and prompt institution of adequate treatment, the need for alerting the entire medical profession to an interest in cancer is apparent. For this reason, the society is continuing to sponsor postgraduate courses in cancer for general practitioners. A course was given at the University of Minnesota in early March and a second course is scheduled for June of this year. Physicians are urged to avail themselves of this opportunity to attend these courses at no financial expense to them.

It would seem unnecessary to stress the need for a greater interest in, and support of, the North Dakota Cancer Society by the Physicians in the state. The lay people, especially the women, who are giving freely of their time and money are entitled to the support of the medical profession. They look to us for guidance and they are keenly aware of the medical viewpoint. They earnestly desire to do something to decrease the morbidity and mortality from the second cause of death; naturally they feel frustrated if their family physicians do not manifest an interest in the problem.

L. W. LARSON, M.D., Chairman

Tuberculosis

The Committee on Tuberculosis is happy to report a steady progress in the control of tuberculosis in our state. Our death rate per 100,000 for 1947 was 14.8 as compared with 33.2 per 100,000 for the United States.

Dr. W. L. Wallbank reports increased length of time of treatment now with full personnel available. Anyone interested in further detail should consult the very complete biennial report of the state of North Dakota Tuberculosis Sanatorium, for the period ending June 30, 1949; this report is by Dr. W. L. Wallbank, superintendent and medical director.

The committee submits the following report from Russell O. Saxvik, M.D., State Health Officer:

"In 1948, the two mobile x-ray units took 70 mm. chest plates on 70,246 people. Of this 67,839 were negative; 1,361 (1.9%) were suspicious; 116 (1.2%) were positive; 930 (1.3%) were demonstrated other pathology and 2,407 (3.4%) were referred to physicians for follow-up.

"As of April 20, 1948, 36% of the entire eligible population, that is individuals 15 years and over, had at least one x-ray.

"From July 1, 1947, to December 31, 1948, 506 new cases of tuberculsis from all sources were reported. As of December 31, 1948, 953 cases were held in the Central Registrar as being under medical supervision.

"The 1949 survey is underway, and, in an effort to improve follow-up services, is being scheduled in areas that have facilities for such follow-up. This generally means that a public health nurse is available for this activity. It is estimated that 80,000 individuals will be x-rayed this year and we can anticipate about the same results as demonstrated in 1948."

Dr. Saxvik also reports:

"Information has been received from Dr. Fred T. Foard, Director of Health, Bureau of Indian Affairs, that a wide scale vaccination with the BCG vaccine will be carried out among the Indian school children in the United States during April, May and June. This work will be the first effort to extend services to all Indian children who are shown by tests to be free of tuberculosis. To carry out the program eight vaccination teams will be employed and sent to the field beginning March 15. Each team will be composed of one physician, one public health nurse, a recording clerk, and probably a medical student.

"Dr. Foard has invited physicians to observe this vaccination program as it unfolds."

A. F. HAMMARGREN, M.D., Chairman

Public Policy and Legislation

A meeting of the Committee on Public Policy and Legislation was held in Bismarck, January 15, 1949. The following action was taken on bills which had already been introduced

by that time; this action is followed by parenthetical explanation of the final action taken by the legislature.

House Bill No. 8, relating to the time within which burial must be made, was approved. (Bill passed and signed by the Governor.)

Senate Bill 28, relating to the prevention of congenital syphilis, was approved. (This bill was passed and signed by the Governor.)

Senate Bills 29 and 30, relating to the grading and labeling of milk, the former being introduced by the Health Department and the latter by the Dairy Commissioner. The committee approved Senate Bill 29, and went on record as opposing Senate Bill 30. (These two bills were the basis of one of the largest political controveries of the session. As a result, Senate Bill 29 was defeated. Later Senate Bill 30 was defeated, but due to a series of unprecedented political maneuvers was recalled the last week and passed.)

House Bill 49, relating to a survey or census of the mentally handicapped, was approved. (This bill was indefinitely postponed.)

House Bill 55, being an appropriation for the Health Department, was approved. (This bill was passed and signed by the Governor at the figure recommended by the Budget Board.)

A review was had of the action taken by the State Board of Medical Examiners regarding DP physicians; and the committee highly commended the board for its action.

The committee went on record to give support to any movement which would eradicate brucellosis in cattle in the state.

It was moved by Dr. Waldschmidt, seconded by Dr. Nierling, and passed, that the committee recommend to the council that Dr. G. M. Williamson and Dr. R. D. Campbell be elected to Honorary Membership in the State Association.

After a discussion of the initiation of a Fifty-Year Club, it was moved that such a club be established.

A sum of $500 was set up as an educational fund, to be expended under the direction of the Executive Committee of the Council.

In addition to the above-mentioned bills, there were a number that came up later in the session in which the Association had a decided interest.

House Bill 122, which was introduced on January 17, gave us considerable concern. This bill provided for the licensure of all foreign physicians, requiring the State Board of Medical Examiners to give examinations in any foreign language chosen by the applicant. The bill was defeated by the cooperation of the members of the State Board of Medical Examiners, the membership of this Association, the aid of the Catholic Rural Life Conference, the Lutheran Aid Society, the North Dakota Hospital Association, the North Dakota Pharmaceutical Association, and—by no means not least—the Woman's Auxiliary to the North Dakota State Medical Association. The presence of Dr. Marcinczyk, a displaced physician at St. John's Hospital, Fargo, was most helpful.

Senate Bill 227, which was a bill for automatic licensure of all trades and professions upon graduation from a North Dakota institution under the supervision of either the Industrial Commission or the Board of Higher Education, was indefinitely postponed in the Senate. Had this bill passed, a medical graduate from any future four-year medical school would not have been entitled to reciprocity in any state in the United States.

Senate Bill 127, which was introduced more or less as a companion measure for the Medical Center appropriation bill, and which bill provided for the integration of hospitals, training of interns, nurses and other hospital personnel, was killed in the House only after the one mill levy appropriation had successfully passed. (This bill was in suggestive form only, and such parts of it as might be desirable can be carried out under present authority given to the Medical Center Advisory Council and the Board of Higher Education.)

Senate Bill 231, being a one mill levy appropriation for the University Medical Center, was passed and signed by the Governor.

Your Association was also instrumental in introducing another fireworks bill, prohibiting the sale of fireworks, similar to the bill introduced in the 1947 legislative session. When the committee hearing was held, the committee reported unanimously in favor of the bill, and we were lulled into a state of false security. Unexpected opposition arose, and the bill was defeated by four votes.

A. D. McCannel, M.D., *Chairman*

Crippled Children

Under the auspices of this committee, the second annual Cerebral Palsy Clinic for North Dakota, by the joint invitation of the North Dakota State Medical Association, the North Dakota Department of Public Welfare, the North Dakota Department of Public Health, and the North Dakota Chapter of the National Society for Crippled Children and Adults, was held at Bismarck, October 13, 14 and 15, 1948.

The objectives of the program were:

1. To stimulate new interest, and to direct activities in the field of cerebral palsy;

2. To promote discussions of the principles underlying the treatment of cerebral palsy;

3. To establish a clinic series providing case studies, diagnosis and treatment recommendations for selected cerebral palsy children and adults;

4. To bring doctors, parents and workers in the field together in order that acquaintanceship and better understanding might be fostered.

The clinic this year, as last, was ably directed by Dr. M. A. Perlstein, a member of the Medical Advisory Council of the National Society for Crippled Children and Adults, Chicago, Illinois. Dr. L. G. Pray of Fargo was chairman of the general meeting.

The clinic was well attended by workers in the Welfare Department and the Health Department. A good choice of clinical material was present for the demonstration clinic, ably directed by Dr. Perlstein and his staff. More physicians attended this year than last; but it would be better if a larger attendance could be accomplished.

It would be well worth the time of all physicians in the state to visit the Crippled Children's School at Jamestown, North Dakota, and gain first-hand information on what can be done for these unfortunates. The school is presently in the process of expansion; and a new wing which will largely increase the potential enrollment for the school, nears completion.

A. R. Sorenson, M.D., Chairman

Public Health

The Committee on Public Health of the North Dakota State Medical Association met in Valley City, North Dakota, March 13, 1949. Those in attendance were Drs. Miller, Gilsdorf, and Saxvik. The following resolutions were discussed and passed upon favorably:

1. As there is considerable evidence of a widespread prevalence of amœbic dysentery in North Dakota, it is recommended that the laboratory personnel of the several hospitals become better acquainted with the technique of diagnosis. It is further recommended that the Division of Laboratories, State Department of Health, upon request, give assistance to these technicians through a short training program.

2. As Senate Bill 28, a law for the prevention of congenital syphilis, has been approved by the 31st Legislative Assembly and as this law requires prenatal blood examinations to be done by either the State Health Department's Laboratories or approved hospital laboratories, it is recommended that a cooperative approval system for serologic examinations be developed.

3. As North Dakota continues to have a relatively high rate of diphtheria, whooping cough and other preventable diseases, it is recommended that immunizations be given to all children under 1 year of age by his attending physician.

4. The Committee on Public Health wishes to go on record that although the 31st Legislative Assembly placed the responsibility for grading and labeling of milk and milk products in the office of the Dairy Commission, these duties should be under the supervision of the local health officer.

It wishes to recommend that all physicians make a special effort to report all milk-borne infections to the Division of Preventable Diseases, State Health Department.

Further, it wishes to record an acknowledgment to the several state-wide organizations for their effort to maintain the health aspects of milk under the local health officers' jurisdiction.

R. O. Saxvik, M.D., Chairman

Public Health—Garrison Dam Project

The Sub-Committee on Public Health—Garrison Dam Project—of the North Dakota State Medical Association, met in Bismarck, North Dakota, on March 14, 1949. Those who attended were Drs. Vinje and Saxvik. The following resolution was discussed and passed upon favorably:

1. As the Sub-Committee on Public Health—Garrison Dam Project—was established primarily to assist in the supervision and control of the medical problems in the Garrison Dam area as related to federal agencies and since, in the course of the past year, the Federal agencies did not launch their anticipated medical care program in that area, or in any other area in the state of North Dakota, and there is no indication that the several Federal agencies anticipate establishing a medical care program, it is recommended that the Sub-Committee on Public Health—Garrison Dam Project—be dissolved as its anticipated functions do not exist.

R. O. SAXVIK, M.D., Chairman

Official Publication

No complaints concerning the Journal-Lancet have reached the committee during the past year, so it is assumed that our official journal is satisfactory. The proceedings of the House of Delegates have been published in good form and the papers presented at the 1948 session are appearing without undue delay. One of the issues of the Journal-Lancet this spring will be devoted entirely to papers submitted by North Dakota physicians.

L. W. LARSON, M.D., Chairman

Fractures

No meetings were held during 1948 by the Committee on Fractures. We have urged the continuance of the policies carried out in previous years.

R. J. WALDSCHMIDT, M.D., Chairman

Report of the Committee on Medical Economics and Its Subcommittees

The report of the Committee on Medical Economics and its Sub-Committees was referred to the Reference Committee to consider the report of the Committee on Medical Economics, including the Sub-Committees on Prepayment Medical Care, Veterans Medical Service and Rural Health.

Report of the Committee on Medical Economics as a whole:

Your chairman attended the following national meetings:

1. A.M.A. Conference on Rural Medical Care.
2. Northwest Regional Conference.
3. National Conference on Medical Care.
4. National Physicians Committee.

In the national field, the subjects of political medicine versus voluntary prepayment of medical care, improvement in rural medical care, trends in medical education, and above all the $25.00 assessment of all members of the American Medical Association, and its resulting campaign directed by the firm of Whitaker and Baxter, have been in the foremost.

Since the general election of last November, the proponents of socialized medicine have been, on paper at least, in a very strong position. Nevertheless, the passage of the so-called Wagner-Murray-Dingle bill is by no means inevitable. Attention is called to the fact that the two major political parties—that is, the Republican party and the Democratic party—both made a campaign issue of further federal participation in the field of health.

The Democratic party of course favored the concept of national compulsory health insurance financed primarily by a payroll deduction tax, to be further subsidized as necessary out of general taxation. Such a program is intended to cover all of the citizens of the United States without regard to financial ability to pay for medical services.

The Republican party largely supported a plan for the participation of the Federal Government in the field of health services, which would provide for grants in aid to the various states for the payment of medical services to both the indigent and the so-called medically indigent. This plan would be financed by general taxation. It would not include those citizens, who with reasonable management of their income, could afford to pay for medical care.

Immediately after the general election, there was a widespread feeling that the Truman proposal might very well be enacted at the current session of Congress, although there were those who felt that the Administration would be too busy with other parts of their legislative program.

Since that time, an additional hope has arisen, due to the formation of a coalition between Southern Democrats and Republicans in Congress. It is impossible to tell over which issues this coalition will stand against the Presidential program. It is interesting to note, however, that last week a bill was introduced by Senator Hill, a Democrat from Alabama, and sponsored by a Democrat, Senator O'Connor, and Democrat Withers of Kentucky, and Republicans Aiken of Vermont and Morse of Oregon, which was offered as voluntary health insurance bill and a substitute measure for the Wagner-Murray-Dingle bill. This bill embodies principles which are largely accepted by the American Medical Association, and it is entirely conceivable that a bill with contents similar to this one may be passed either at this or at some early session.

Mr. Oscar Ewing continues to press for increased power and for the all-out expansion of the FSA agency under a departmental status of cabinet rank, towards the establishment of the largest bureaucracy ever known to this country.

Great stress should be laid on the singularly forward steps taken by the A.M.A. in combatting the enactment of a national compulsory health insurance scheme. Unprecedented action was taken by the House of Delegates of the A.M.A. at its interim meeting in St. Louis, when an assessment of $25.00 per member was voted for the first time in the history of the American Medical Association. The eminent firm of public relation counselors, Whitaker and Baxter, were hired to carry out this program.

This money will not be used as a "slush fund" for lobbying in the various legislatures of the various states; nor will it be used for such purposes in connection with the Federal Congress. Rather, these moneys will be used for the establishment of a "grass roots" educational campaign throughout the entire United States. The campaign will be formulated around a thirteen-point program adopted by the A.M.A. The backbone of this thirteen-point program is the promotion of voluntary prepaid medical care plans, since such plans are proposed as the very best method of easing the problem of payment for medical care in America, and held forth as highly superior to the concept of national compulsory health insurance.

Approximately 40 per cent of the members of this Association have paid their assessment through the State Office. While this is a satisfactory start, collections of assessments should reach 100 per cent, as failure to pay will not only cripple the program but give encouragement, comfort and ammunition to the proponents of national compulsory health insurance.

In North Dakota, the left wing elements are at present concentrating on propaganda for the passage of a national compulsory health insurance plan. They are not at the present time promoting actively any changes in the method of medical practice in the state of North Dakota.

In the field of medical education, emphasis continues to grow upon the education of general practitioners. The general practitioners' section of the American Medical Association and the annual General Practitioner Award have given impetus to this trend. In North Dakota the passage of the one mill levy for the financing the University Medical Center may very well in the future play an important part towards this end. It is, however, too early to anticipate the program of the University Medical Center; but it is recommended that sincere consideration be given to the report of the Committee on Medical Education.

Your committee has had extensive negotiations with the Welfare Board during the past year relative to the Welfare Board fee schedule which has been followed for some years.

Inasmuch as the recommendation which will follow is a drastic change in policy, it becomes necessary to review the history of our experience with the Public Welfare Board. The Public Welfare Board system was set up during the depression years as an honest effort to bring order out of the chaos which existed in relief matters. Doctors, having an age-old tradition of treating indigents on a charity basis, were quick to co-operate with this new program. Since that time the Public Welfare Board has grown in importance, until it is probably the largest

single agency today in the state of North Dakota. The trend of both State and Federal legislation is such that the Welfare Board is bound to have an increasing influence on the affairs of all the citizens of North Dakota.

The rise in the Social Security system has introduced the concept that individual charity is no longer a duty of either the American people or the American medical profession. To the contrary, the Federal Government promotes the concept that indigents are recipients of all of the services provided by the Federal Government as a matter of absolute right. The Government proclaims that it, itself, is now taking care of all of the needs of the indigent.

It was quite natural that the medical profession, having been accustomed to taking care of the medical needs of the indigent on a charity basis, should have been most co-operative in setting up a fee schedule for the indigents on a basis of charges greatly reduced from the normal charge to the ordinary patient. In this, the medical profession was unique in that all other vendors to Public Welfare recipients charge the normal amount for their services or merchandise. At no time has it ever been pointed out that medical care is only being supplied to their clientele because of the fact that the doctors are working at a low fee schedule and are in effect contributing approximately 50 per cent of the cost of this care.

The Public Welfare Board and its parental agencies, the Social Security Agency and the FSA, are continually pressing for legislative enactment which will increase the number of persons who will receive their services, and for the general expansion of the scope of their program. Since the Government is undertaking this responsibility, we should see that the Government assumes its responsiblity in full.

The recommendations that will be forthcoming in this report would not be necessary if it were possible to negotiate with the Welfare Board so that a reasonable fee schedule might be adopted. Such, however, is not the case. The original fee schedule was set up in 1937, with the intention that it would reflect a schedule approximately 50 per cent of the average and normal fee charged by doctors in North Dakota. This was revised very moderately in 1944. At the present time the fee schedule probably does not reflect a charge of much more than one-third of that which is charged the normal patient.

Extended negotiations were had not only with the Public Welfare Board last summer, but also with representatives of the various county welfare boards and their executive directors. While the persons representing the various county welfare boards were wholly in agreement with the items and the fee schedule which the Association sought to have changed, the Public Welfare Board itself nevertheless undertook to turn down and refuse approval of the various items.

It is felt that it is futile to negotiate further with the Board. Their attitude has resulted in the controlling of fees at an absolutely unreasonable low level. North Dakota doctors cannot permit an agency of such importance as this one to arbitrarily control the economics of medical practice.

Accordingly, it is recommended that the North Dakota State Medical Association notify the Public Welfare Board that the advisory fee schedule now in effect is considered to be rescinded; and that in the future doctors in North Dakota will feel free to charge Public Welfare Board cases such fee as in their own opinion seems proper.

In closing the report of the committee as a whole, I would like to express the appreciation of this committee for the splendid work done by Dr. Lancaster and his Committee on Prepayment Medical Care; Dr. Radl and his Committee on Veterans Medical Service; and Dr. Jacobson and his Committee on Rural Health. It is recommended that these three committees be continued. The reports of each committee follow and each report has the approval of the Committee on Medical Economics as a whole.

W. A. Wright, M.D., Chairman

Prepayment Medical Care

This past year has seen some accomplishment and some realization in the expansion of the North Dakota Physicians Service throughout the state. The success of the program has been definitely minimized to some extent because of the fact that certain district medical societies have seen fit not to approve of, nor participate in, the program.

Voluntary prepaid medical insurance has become universally accepted in the United States as the strongest answer to national compulsory health insurance. Enrollment through the various state plans has progressed by leaps and bounds. The "grass roots" educational program of the A.M.A., directed by the firm of Whitaker & Baxter, uses the concept of voluntary prepaid medical insurance as the premises on which to fight national compulsory health insurance. In order that the state of North Dakota may properly hold up its end of this battle, the state should be provided with a strong prepaid medical insurance program on a statewide basis.

As stated in the report on the Committee on Medical Economics, it is probable that either at the present session of Congress or at some early session, some legislative proposal will be enacted for the further participation of the Federal Government in the field of medical care. It is hoped that this expanded participation may be limited to the contribution of Federal moneys towards the medical care of the indigent, as distinguished from the care of the total population regardless of their ability to pay.

The Taft-Ball-Smith Bill of the last session, and the Hill Bill of this session, are both of the preferred type. Both bills would provide grants in aid to the various states for the aid in caring for the indigent and the so-called medically indigent. Both would permit the expenditure of these Federal moneys for the payment of premiums in voluntary prepaid medical insurance plans.

There follows a resume of the various meetings of the Prepayment Committee throughout the year, together with action taken at such meetings; and further together with a report of the present status of the development of the North Dakota Physicians Service within the state of North Dakota.

At the last meeting of the House of Delegates, that House unanimously approved a recommendation that the Committee on Medical Economics and the Sub-Committee on Prepayment Medical Care be authorized to proceed with the necessary arrangements with the existing North Dakota Physicians Service operating in Cass County, so that this plan might be extended on a state-wide basis. It was further provided that any arrangements effected by this committee should be presented to the Council for final approval.

Such a meeting was held in Fargo, July 2, 1948. At that time all necessary arrangements were made for the eventual transfer of control of the North Dakota Physicians Service from its Board of Directors, constituted of the Cass County physicians, to a state-wide board. The reserve of $21,000.00 was also transferred. The details of these arrangements were then submitted to the Executive Committee of the Council, and were approved.

As a result of the announcement issued by the State Office of these accomplishments, a number of complaints were received. In order that all might be heard, the Committee on Prepayment Medical Care then sponsored a general meeting held in Bismarck, September 12, 1948. At that time numerous complaints were voiced as to the service feature of the plan, the opponents stating that physicians should be entitled to charge those having high incomes an additional charge in excess of the fee schedule. Objections were also made as to the fee schedule, stating that the same was too low.

Upon the close of the open meeting, the Committee on Prepayment Medical Care met shortly to inquire as to whether an effort should be made to compromise the program. The outcome of the meeting was to propose a modification of the plan, changing it from a complete service to a so-called partial service and indemnity plan. Under such a plan persons having an income lower than a stipulated amount would be guaranteed that they would receive no further bill for medical services. Those above the stipulated income level would be subject to such further charge as the doctor believed proper.

A further outcome of this meeting was the decision to find out what increases in the fee schedule would make the plan more satisfactory. The members of the committee were instructed to go back to their various communities and talk this matter over with the members of the local societies, and be prepared for a further meeting to be held in Fargo, October 2, 1948.

At the meeting in Fargo October 2, reports made it clear that the new proposal would be more acceptable throughout the state. The outcome of the meeting was the adoption of the so-called Partial Income, Partial Indemnity Plan; with enrollment limitations of $3,000 for a single individual, and $5,000 for a family.

Under this plan an enrolling doctor would guarantee the complete service for all items covered for all individuals having an income of $3,000 or less; but might make additional charges for all individuals whose income is higher. Likewise, the enrolling physician would guarantee service for all policies covering families having an annual income of $5,000 or less; but would be entitled to make additional charges in the case of all families receiving an income in excess of $5,000. The fee schedule was readjusted so that the old maximum payment of $150 was now raised to $250.

A further meeting of the Committee on Prepayment Medical Care was held in January in Bismarck, at which time a report was made as to the status of the North Dakota Physicians Service.

The most recent meeting was held in Fargo, April 2, 1949, at which time this report to the House of Delegates was formulated, and the program was again reviewed. At the present time extension of the North Dakota Physicians Service is being promoted in the following locations: Valley City, Oakes, LaMoure, Devils Lake and Dickinson. Further promotion will be effected in the Traill-Steele District, Williston, and such other areas as have indicated their desire to participate. Adverse weather conditions and bad roads have slowed expansion in enrollment, although more than 2,000 of the subscribers have been enrolled since the latter part of January. The following District Societies have so far indicated their disapproval of the plan, although some have stated that they have not intended their action to be final: Bismarck, Minot, Grand Forks and Jamestown.

There has been a liberalization in the ruling that all procedures must be performed in hospitals; and tonsillectomies, fractures and obstetrical cases are now paid even though performed outside of a hospital. Liberalization of the Blue Cross plan is now in the process of being effected; and it is the opinion of the committee that the combined coverage will be excellent, and that the fee schedule is most favorable.

It is therefore recommended that the House of Delegates commend and approve the expansion thus far of the North Dakota Physicians Service, and that all members of this Association be urged to participate in this program so that it may be expanded into all areas in the state of North Dakota.

W. E. G. LANCASTER, M.D., Chairman

Rural Health

Your chairman of the Committee on Rural Health has very little further to report for the 1949 Handbook, on the extension of rural medical service. Due to weather conditions, your chairman was unable to attend the National Rural Health Council meeting in Chicago, and cannot personally report on this meeting. He has, however, asked Dr. Larson of Bismarck and our Executive Secretary to make a few comments on this meeting.

Blue-print work for the development of better rural medicine in North Dakota has been continued throughout the year. The Medical Center Advisory Council, this Association's Committee on Medical Education, and the Board of Higher Education are working on a plan to attract younger physicians to the rural areas in the state. It is hoped that this can be accomplished through the University Medical Center, now adequately financed through the one mill levy.

Plans are being worked out for the possible use of scholarships to induce graduate physicians to return to North Dakota for internship and a period of medical practice in rural communities.

The action taken by the North Dakota State Board of Medical Examiners relative to the Displaced Physician also produces hope for the more adequate supply of more rural physicians.

Again the development of small rural hospitals, properly placed, will attract these younger physicians.

The shortage of nurses still prevails. The production of practical nurses under the practical nurses schools, while slow, is having some success in meeting the shortage of bedside nurses.

Weather conditions have prevented the organization of the experimental Local Health Council at Elgin, North Dakota. The subject has been discussed by the Board of Directors of the new hospital, and all members are interested in establishing such a Council.

It is thought that the exchange of experience and information relative to the newly established rural hospitals in North Dakota may be of some value. With that in mind, such information is herein given in connection with the Elgin Hospital; and attempts will be made to obtain like information concerning other rural hospitals for distribution.

The Lorenzen Memorial Hospital, located at Elgin, North Dakota, is a community type of hospital, consisting of 31 adult beds and 12 bassinets in the nursery. The building was designed by Dr. E. Salomone, one of the associates of the three-doctor clinic located in the city of Elgin. An attempt was made to design a building that would suit the needs of the community, and also be within the financial means of this community.

The cost of the building was $120,000, and the cost of the equipment $30,000. The hospital was built by general contractors Cummings & Meissner of Bismarck, North Dakota, on a cost-plus basis, 10 per cent on materials and 15 per cent on labor. Wiring, heating, plumbing and sewer contracts were separate, on a cost-plus basis. All material was purchased by a local committee.

The hospital was financed by local contributions. To date $117,000 in cash has been contributed; $28,000 more will be needed. At the present time there are 12,000 contributors, with an average contribution of $90.75 per contributor. Another $24.00 per contributor will raise the balance of the money needed. This $24.00 per contributor may seem like a small amount; but the chairman of the finance committee can assure you that a lot of work and planning will still have to be done to secure the $28,000 needed. The finance committee is now busy making plans to hold a Hospital Day in early May, with the attraction of an old-time Western barbecue.

The Elgin Hospital participated in Federal moneys in the Hill-Burton bill only on the equipment, which amounted to a little in excess of $10,000; which arrangement worked out very nicely. This hospital did not participate in Federal money for the building because the building was almost completed before the Federal moneys were released; and secondly, the building does not meet all of the Federal rquirements, primarily because floor space was reduced below Federal level requirements.

As experience data becomes available to your chairman on the hospital completed at Hazen, those in the construction and planning stages at Hettinger, Watford City and Cooperstown, such information will be distributed.

There followed a report for nine months' operation of the Elgin hospital.

M. S. JACOBSON, M.D., Chairman

Veterans Medical Service

The following is the report of the chairman of the Sub-Committee on Veterans Medical Service of the Committee on Medical Economics of the North Dakota State Medical Association. Activities of the North Dakota Veterans Medical Service Division during the year 1948 appear to be satisfactory to all concerned. The Division has handled a large volume of work. There has been very little criticism either from the Veterans Administration or from the practicing physicians throughout the state who are co-operating in the program. Mr. John Fox, the present director, who replaced Mr. Samuel Gurke, is handling the office very capably. It was hoped that at the time of this report that a definite decision would have been made in regard to one point regarding financial arrangements between the Veterans Administration and the Medical Service Division. The problem referred to refers to payment of administrative procedures and processes for uncompleted examinations of veterans examinations. Negotiations in this regard have been going on for some time and if the approximate 10 per cent to which the Veterans Medical Service Division is entitled for completed examinations can be extended to uncompleted examinations, the sustaining amount paid by the North Dakota State Medical Association can be repaid or equalized. Prospects are that this procedure will be approved so that there will be reimbursement of the loss sustained in operation since the inception of the program and it is hoped and felt that some sort of financial settlement will be made in the near future.

Currently, in the matter of cancellations the situation has improved since a rendition of last year's report. For the calendar year 1948 the figure would be approximately 11 per cent. Part of this percentage is attributable to the inability of the veterans to report for examination because of snow-block roads.

A fiscal report for the year 1948 should be of interest to the physicians in this state. Authorizations were received in the

total amount of $93,600.27 and the average authorization amounted to $19.15. The actual amount vouchered, that is, the amount actually handled in examination and treatment amounted to $81,643.33, which is approximately a $12,000 loss during the year, or $1,000 a month, as compared to the authorizations received. The total amount of rating examinations, or examinations otherwise authorized, amounted to the total of $49,300 and authorizations for treatment amounted to a total of $30,800; the ratio of examinations to treatment is approximately five to three.

The total amount received for examinations and treatments by the Veterans Medical Service Division as stated above, is $81,643.33.

Actual amount paid to doctors in the State of N.D.	$74,012.77
Total operating cost	7,291.94
Income fees collected	7,423.00

It can be seen, therefore, that the balance for the year 1948 is on the positive side.

It is the feeling of the chairman of this committee that the Veterans Medical Service Division is being well handled and efficiently and the general trend is one of progress rather than of regression.

R. B. Radl, M.D., Chairman

SPECIAL COMMITTEES

The following reports of Special Committees were referred to the Reference Committee to consider the Reports of the President, Secretary, Executive Secretary, and Special Committees:

Industrial Health

The survey of all industries in the state to be conducted by the State Board of Health and the Workmen's Compensation Bureau has not been completed to date.

In reviewing the vital statistics for 1948, we find that there were 23 accidental deaths occurring in industry as compared with 117 deaths on the highways, 46 in agriculture, 23 in fires, and 27 by drowning.

There is evidence which tends to indicate that the physical condition of the employee was often a factor in the occurrence of the accident and it would seem desirable that some effort be made to develop the practice of utilizing physical examinations before assignment of workers to many types of occupation. Faulty vision is often a factor in industrial accidents.

The new form of death certificate which is now used correctly goes into more detail relative to the circumstances of the injury and death. We request the active cooperation of every doctor in filling out such certificates in detail to the end that more positive information may be available to the Bureau of Vital Statistics, which in turn may lead to better accident control in industry.

C. J. Glaspel, M.D., Chairman

Emergency Medical Service

Since our last state meeting at Jamestown there have been no further meetings of the Committee on Emergency Medical Service. There was a meeting in Chicago at which state chairmen were requested to be present, but the chairman of your committee was not notified in time and incidentally was out of the state at the time of the meeting, so he was not able to attend.

There is still considerable stress being made regarding knowledge of atomic warfare and there have been several postgraduate courses which have been under the auspices chiefly of the military in order to disseminate information regarding diagnosis, treatment, and care of radiation casualties. Although they are of very little practical importance to the individual doctor in this state, they would be a refreshing type of course as well as extremely interesting and those that would be interested are encouraged to take such a course.

No further emergencies have arisen in the state which have needed action by the medical profession. As you know, there is a definite shortage of medical officers for the Armed Forces. The American Medical Association has been able to promote their ideas on the procurement of medical personnel for the Armed Forces and apparently not too good results have resulted. Within the last sixty days the executive secretaries of the state associations have been notified of doctors in their states who are believed to be eligible and also who it is felt should volunteer for service in the Armed Forces. At this time, I believe, we have only been called upon for two men. One resides in a small rural area and without any question is necessary in that locality. The other doctor practices in an area where there is sufficient local medical care, and probably it will be expected of that individual to make some move. It is felt that we should move slowly in this matter. That is the way it appears at this time, but this picture could rapidly change in the case of a national emergency. Probably it is just as well that we do not act too hasty in trying to force any of the doctors in the service. However, if the pressure does become too great and there are not sufficient doctors in the service, there will undoubtedly be special provisions made by Congress for drafting of doctors. Public opinion is going to demand that. If we are to put young men into the Armed Forces, they will have to have adequate medical care, and, if necessary they will be drafted for that purpose.

A. C. Fortney, M.D., Chairman

Mental Hygiene

The Committee on Mental Hygiene met at the North Dakota State Hospital, Jamestown, N. D., March 15, 1949.

We took the view that the mental hygiene of an individual is related to his thinking, feeling, behavior, heredity and environment and other factors. There is no line of separation in the human between those subjective experiences commonly associated with mental health and his organic well-being. From a medical point of view the body and mind are so interrelated as to become fused in the person of the individual. Accordingly, such studies and recommendations as were made were so done on the basis of regarding the human being as a socio-psycho-biologic unit.

Last year's report of Dr. A. M. Fischer, superintendent of the North Dakota State Hospital, was reviewed and was again endorsed. Dr. Fischer is to be commended for the manner in which he conducted the hospital of which he is superintendent, particularly under the circumstances of stress during the war years, with shortages of help and without the facilities that might otherwise have been available to him.

The committee estimates conservatively that there are between 25,000 to 50,000 people in the state of North Dakota who are more or less disabled through emotional or mental ailments. This represents not only a great deal of distress to the individuals concerned but also to those who are related or intimately associated with these ailing people. For the most part these conditions are remediable through an enlightened program involving understanding and skilled attention. These ailments cause a loss of productive power through inefficiency or inability to work, an economic loss that runs into millions of dollars. Furthermore, they create a drain on public funds in substantial amount for the support of those whose ailments have progressed so far that they cannot support themselves.

The state of North Dakota is not singular in the forty-eight states with respect to the burden that exists in impaired mental health. The mental hygiene of the people is so much a national problem that the Federal Government took a forward step to meet it by creating the National Mental Health Act of 1946. By this Act, states which show interest in helping themselves to improve the lot of the emotionally and mentally ill will receive some aid from the Federal Government.

This committee feels that some stigma has become associated with the word "insane", and accordingly considers the use of the word "insane" or any of its derivatives unfortunate. We recommend the avoidance of the word medically or officially insofar as is possible, and such terms as "hospital for the insane," "insanity commissioner," "insanity hearing," should be abolished. The word "insanity" has a rather vague meaning medically and legally and at the present time is offensive.

The population generally, including public officials, organizations and all leaders should be made aware of the existence of nervous and mental ailments and should be advised that most of these conditions can be helped. Actually, the aim of a good Mental Hygiene Program should be directed to the general welfare of all the people of the state, and for the present time its center of activity should be removed from the locale of a hospital which is given over entirely to the treatment of the mentally ill.

Efforts toward the improvement of the mental health of the state should radiate from some central agency such as a State

Board of Health or a medical center. This agency should coordinate all efforts that are directed to this common purpose, and should serve as a source of enlightenment to the general population and should stand ready to counsel such officials, organizations or other agencies that might seek its help. In this field of medicine considerable is to be gained by creating a central point of information and responsibility with defined and limited authority.

This committee feels that it would be advisable and appropriate to encourage every general hospital in the state, built or being built, insofar as its facilities will permit, to put aside several beds or a ward for short-term treatment of the emotionally or mentally ill patients. Since from a medical point of view there is no greater shame in suffering with a psychoneurosis than there is in having a broken leg or appendicitis, the patient should be spared as much as possible the stigma that unfortunately exists at the present time in being referred to a hospital for the mentally ill, and he should be permitted to enter a general hospital. In this way, in due time with increased facilities and trained personnel more people will be getting better treatment, who perhaps are now getting none, and the patient load would be taken off the state institutions which are intended for the chronically ill.

The present forms of commitment to a hospital for the mentally ill are outmoded. The present procedure for sending a patient to a hospital for the mentally ill is quasi-judicial. It involves a county judge, a hearing with witnesses and perhaps a jail and a sheriff. If a man had gallstones he would be spared this archaic procedure, and would be referred to a hospital by his physician if necessary. This committee recommends that a person who is emotionally or mentally ill should be treated as a sick human and that he be permitted to enter a hospital for the mentally ill on the recommendation of only one duly licensed medical practitioner, or on his own voluntary application for examination, providing the superintendent consents to his admission.

In a review of 30,000 cases where patients have been admitted to a hospital for mentally ill for examination only on the recommendation of a physician, there has been only one instance where there was a question of the abuse of the patient's rights in the matter of admission to the hospital. In the ordinary course of transactions between human beings one error in 30,000 admissions presents a percentage error that is probably less than that which occurs among humans in most fields of endeavor.

The patient could be referred to a hospital for the mentally ill or to the ward of a general hospital for examination on the recommendation of one physician and there is little likelihood of the patient's rights being abused, since so many other factors and individuals enter into his hospital life, and he always has the right of communication with his relatives or his attorney, and he has the right of appeal before the courts if he thinks his liberties are being abused and he has the right of habeas corpus, as any person has who is admitted to a general hospital.

Bearing in mind our concept of a human as a socio-psychobiologic unit all forces should unite in making his lot a happier one, and it is recommended that teachers, clergy, court officials, social service workers, and others charged with the responsibility of influencing or guarding the public character should have a course in normal psychology and abnormal psychology, if they have not had training in this field, and should have access to experts in mental hygiene for particular advice.

In regard to education, intelligence and personality tests should be conducted in all schools. Where children are found to be emotionally disturbed or mentally handicapped or exceptional, they should be looked after by a teacher who has been specially trained in these problems, one who might by kindness and understanding and special coaching help these children to become adjusted. It is recommended that these children insofar as is possible be kept in or near their home environment, and as previously remarked special classes should be held in large schools in Grand Forks, Fargo, Valley City, Jamestown, Bismarck, Dickinson, Mandan, Williston, Minot, Devils Lake and in other communities where such classes could be sustained.

At the present time the Department of Public Instruction of the state of North Dakota is sympathetic to the problem of so examining the school children and has recommended a battery of tests for this purpose, but only a few schools use these tests. Probably the best work and the most extensive testing along these lines is done under the supervision of Dr. William L. Neff, superintendent of Mandan schools, Mandan, N. D. After testing there still remains a question as to what shall be done wtih a child who varies from the normal average or presents a problem. The recommendations previously set forth point to a solution.

There are some short form tests that are suitable for the use of a physician or any capable person in making an approximate determination of the personality and the intelligence of the individual, and these were endorsed by the committee.

In the matter of juvenile delinquency the committee felt that several factors were responsible. It was also felt that remedial measures existed in enlightening all those who have contact with children, particularly parents; and the committee felt that among the best bulwarks against juvenile delinquency were the Sunday schools, the Boy Scouts of America, the Girl Scouts of America, the 4-H Clubs and other organizations which are inclined to instruct and to give constructive expression to the energies of our youth. The juvenile officer should have access to a physician competent and trained in matters of mental health.

A conference was held in the office of the Attorney General. An attempt was made to define certain terms such as "competence", "degree of guilt", "insanity", "civil liability", "testamentary capacity", "free will", "extenuating circumstances", and other medico-legal terms. The laws of North Dakota are in the vanguard of understanding of the problems of the "nervous" individual, but there is still some residual tradition in the terminology and the attitude of the law towards the emotionally or mentally ill person. It appears that opinions on medico-legal jurisprudence are at the present time based upon the North Dakota Revised Code of 1943 (which gives a very ambiguous definition of "insanity"), the Northwestern Digest of 1931, Herzog's Medical Jurisprudence, American Jurisprudence and other books on law relating to the subject. This committee respectfully recommends that the courts should have access to the advice of a competent psychiatrist who might in good faith advise the court without bias, not acting either for the defense or for the prosecution. This service to the courts should be available both in criminal matters when desired and even in civil matters such as would require the determining of the competence of a testator.

This committee asked for a statement of policy from the Public Welfare Board with respect to the treatment of those who are emotionally or mentally ill. The Public Welfare Board replied in a letter which briefly outlined its policy and indicated that it was interested in the mental health of those who required its assistance. This committee recommends that all social service workers study normal and abnormal psychology and apply their learning to the field of social service work. It is also recommended to the Committee on Medical Economics of the North Dakota State Medical Association that they consult with the Public Welfare Board with a view to setting up a schedule of fees for the out-patient treatment of those who are mentally or emotionally ill and who are eligible through economic circumstances to receive assistance from the Public Welfare Board. The schedule of fees of the Veterans Administration for outpatient private care of veterans might serve as a guide.

It is recommended that a psychiatrist should be on the Parole Board for the North Dakota Penitentiary and should be available to all state institutions where persons are either kept in custody or are supported as guests.

It is recommended that in the future the North Dakota State Board of Medical Examiners shall not permit candidates for license to practice medicine in North Dakota who do not show an understanding of the human as one unit mentally and organically, and who do not show a general fundamental knowledge pertaining to mental health, for example in the field of subnormal intelligence, psychoneuroses, organic and constitutional psychoses, and what is commonly termed as psychosomatic or somato-psychic medicine. Certainly anyone not understanding the fundamentals of a medical problem which affects so vitally such a large portion of the population is not properly prepared to practice in this state.

In May 1947, the undersigned submitted to the North Dakota Department of Health a preliminary rough draft for a Mental Hygiene Program for the state of North Dakota for inspection and discussion. This committee is impressed by the

interest that is shown by the North Dakota Department of Health in the problem of Mental Hygiene for the state and is pleased to note the efforts made by this department in the field of intelligence and personality testing.

This committee feels that a Mental Hygiene program for the state of North Dakota should be directed towards betttering the lot of all the people in the state and should have in mind not only the few thousand who require institutional care but the tens of thousands in the general population who are indisposed. An outline of a proper Mental Hygiene program for the state of North Dakota is an essay in itself, and it is not intended to go into detail with respect to such a program in this report. However, the general principle should be noted that the program is intended for all the people of the state, and it should invite the study and efforts of all those who are in key positions in guiding the people. While it is expected that in time a number of clinics for the purpose of improving mental health will be established throughout the state, this committee feels that it would be advisable to start with one clinic of a particualr type which will serve people of all ages and at all economic levels for various emotional and mental ailments. Such a clinic could be modelled after a pattern which would include the best features that exist in other mental hygiene clinics such as exist in the state of Maryland or the province of Ontario. This clinic would be a beginning, and would be a pilot clinic from which we might derive experience as to our needs, and most efficient methods, and could provide us with data which would apply more particularly in many respects to our own state. A minimum staff of such a clinic should consist of a psychiatrist, a psychologist, a nurse who may act as a social service worker, and a secretary. Questions of location of the clinic, administration, standardization of records, and other matters could be solved in time. The chief obstacles at the present time would seem to be the lack of funds and qualified personnel.

The committee noted the present mental health program of the Veterans Administration in regard to the out-patient care of veterans in this state. The committee commends the Veterans Administration for its enlightened program and believes that the veterans are getting fairly satisfactory out-patient care. The care of the veteran away from a hospital for the mentally ill and near his own home has a definite advantage for the veteran over ward care in a hospital, except in unusual circumstances.

Practitioners of medicine have in recent years become increasingly aware of the existence of other than purely organic factors that force so many people to consult the doctor because of a variety of aches and complaints. So often the informed practitioner has not been satisfied with the organic findings as a cause for the somatic complaints of his patients. More and more we are inclined to agree with Dr. Walter C. Alvarez' short and pointed question when investigating a patient's complaint, "Are you happy?"—so frequently the very key to the understanding of the complaint which at first glance seems to be organic in its origin.

R. H. Breslin, M.D., Chairman

Nursing Education

There having been no urgent problems presented by the Nurses Association this year, your committee on Nursing Education has not met. Your chairman, however, has been kept in touch with the nursing situation through the state office. A representative of the state office has attended nursing group meetings.

G. W. Toomey, M.D., Chairman

Displaced Physicians

This is a new committee appointed as a result of action taken by the North Dakota State Board of Medical Examiners at its January 1949 meeting. It is yet too early to make a worthwhile report as to the status of the displaced physician as carried out under the proposal of the State Board. Two displaced physicians are now located in North Dakota, one at St. Alexius Hospital, Bismarck, and one at St. John's Hospital, Fargo. Arrangements are being made for the location of two displaced physicians in St. Luke's Hospital, Fargo.

The primary work of this committee thus far has been the public explanation of the problems faced in locating displaced physicians. In this respect a review of the situation surrounding House Bill 122 is in order:

House Bill 122 was introduced into the legislative hopper without any warning. Several of the committees of the State Medical Association had just terminated a session in Bismarck on Sunday, January 16, and the following day this bill was introduced. It was feared that there would be some type of medical legislation introduced but the exact nature had never been determined. You are all acquainted with the bill and we are all acquainted with the resolution which was passed by the State Board of Medical Examiners at their meeting in Grand Forks in January. This resolution which was adopted was the first one in the United States for which some concrete proposal was advanced for the displaced physician and to all of us who studied it, it seems to be entirely satisfactory except for perhaps a few minor deviations.

House Bill 122 showed the lack of knowledge by the sponsor of the situations that faced a displaced physician on coming to this country as well as a failure to understand the means by which they were brought here. It further seemed to indicate that certain people felt that the North Dakota State Board of Medical Examiners was deliberately keeping doctors out of this state to further their own ends. For that reason and for that reason only can we see any reason why they wish to place a reviewing board above the North Dakota State Board of Medical Examiners.

First, we must all realize that the bill was not a party bill. There were many of us who felt that there was a direct political faction behind this but after arriving in Bismarck and discussing the situation with Mr. Engebretson as well as noting the members who had signed the bill and introduced the bill and afterwards in talking to other legislators who are and always have been sympathetic toward the medical profession, we found that this bill stemmed from a dire need of physicians in the rural areas. I do not believe for one minute that the bill was intended for any other reason than this and although the judgment that was used in the wording of the bill was not the best, certainly the shortage of physicians in the rural areas was the motivating cause. It was interesting to note that the legislators are really a pretty good group of people once you get to know them and get a chance to talk to them separately. Those that we talked to were conscientious and were willing to know the facts of the case. Many of them had been misinformed and many of them did not understand the orderly processing of doctors in this state. But once they were shown the dangerous pitfalls that could occur if House Bill 122 went into effect, they promptly changed their minds and promised support to quash the bill. It is of interest to note that in our personal discussions with the legislators, especially those who were on the committee to hear the bill, only one really gave us trouble.

Mr. Engebretson arranged to meet with the legislators and arranged the line of attack for the various groups who were to testify against House Bill 122 before the committee. We all knew what we were going to say beforehand and we all knew what we were going to do if we were confronted with an embarrassing question because we felt that as a group any question they could ask us would not be embarrassing since the representation there was adequate to take care of it. It is interesting that just such a thing did take place. Our hearing before the committee went off in 1-2-3 order. Dr. Spear's clearly and easily understood dissertation on the actions and functions of the State Board of Medical Examiners dispelled any ideas of favoritism by the Board. The explanation given by Miss Clementson and Father Hylden as to how displaced persons were brought to this country quickly showed the committee that there were not thousands and thousands of displaced doctors in Europe that were available nor could hundreds and hundreds be brought into this country with a beckon of the hand. As a matter of fact, they clearly showed how minutely these displaced persons were screened and the time that it takes and the slowness of the entire process. Finally the crowning blow against House Bill 122 was the very fine dialogue put on by Father Andrews and Dr. Marcinczyk, the displaced physician from Fargo. Several questions were asked and, I believe, all of them were promptly and satisfactorily answered to the committee men. Mr. Wolfe, chairman of the committee, I believe, was really sincere in his bill but his approach was one which stems from a feeling of panic and before the session was over it was obvious that he had lost his usual good control and practically agreed to anything to get his bill through. However,

very sensible committee men simply stated that if the bill would be of no value it was no use to pass and it was soon killed when the committee went into executive session.

It is not a difficult thing to testify and to present the facts before these legislative groups when one is telling the truth. It must be a rather difficult process when someone is scheming and trying to take advantage. There is no question but what a dire need exists in this state for doctors. It is true that at present our over-all ratio is one doctor to 1,450 patients but the sad thing is that the distribution is not equal. There are areas constituting an entire county in this state that have no doctors. This is regrettable but as has been explained to everyone, we are not able to tell doctors where they have to go and what they must do, that is, American educated doctors. As the resolution passed by the State Board of Medical Examiners is observed, it will be noted that for at least five years the problem of doctors in rural areas actually is answered since after finishing their internship or indoctrination they are required to go to the locality that is selected by the sponsoring agency and approved by the Board of Medical Examiners where they practice medicine for four or five years on a temporary permit. At the end of this probationary period, they are given their full permit and of course they can then practice where they wish. It is hoped that by the end of five years, these men will so like the area that they are in, that they will make it their home. Now, as to the number of physicians which the Board will accept for examination. Eight was given as the number in the resolution. This had to be done because the sponsoring societies had to have a quota and secondly, having had no experience with this kind of problem it was felt that we were safe in dealing with eight. This figure eight became of paramount importance to everyone on the committee and this was soon recognized. After a telephone consultation with the members of the Board of Medical Examiners, it was felt that this figure need not be a permanent one but could be changed according to the number of DP's that come in and also according to the ability of the various institutions in the state to handle them. This was agreed as being quite satisfactory by the committee. As to the time of indoctrination or internship after hearing Dr. Marcinczyk's testimony, it was obvious that all of the committee thought it was a wise and highly desirable move. Now that this bill has been killed, we must not sit back and fold our hands complacently and wait until the next session of the legislature. We must do everything within our power to improve medical care in the rural areas, whether it be by obtaining doctors or inducing doctors to go into these areas or by improving methods of communication and evacuation of sick and injured in those areas to the larger places. Much thought must be given by the Medical Association and other groups interested in the welfare of the people of this state during the next few months. And certainly something should be worked out. Never before in the history of the legislature has there been so much talk in the halls of both the House and the Senate of medical care in the rural areas. Everyone was talking about it and one prominent legislator told me that it was unquestionably one of the hot topics of this session. I believe that we should encourage hospitals that have the facilities to try and help to indoctrinate these DP's as they come. An inquiry is now being mailed to the American College of Surgeons to note whether the taking on of these DP's will in any way influence the standing of the hospital for the regular internships and fellowships. It has been mentioned already to one of the examiners who thought it was a very noble enterprise and did not think that it should have any reflection whatsoever upon the standing of the hospital insofar as it was accredited for internships and fellowships.

Finally, the value of having someone who understands both the medical and legislative side of medicine was beautifully exemplified. I believe that the legislative committee of the State Association should be very active. Many of the representatives and senators have mentioned how they like to see doctors around the halls because from them they can get important information and ideas about what to do when certain things, such as House Bill 122, spring up. However, the halls are certainly conspicuous by the absence of doctors. Finally, I should like to say that Dr. Stucke, who has been a long time legislator from North Dakota, sort of delivered the final punch to our cause and we should be justly proud and thankful of the way he gave the coup de grace.

A. C. FORTNEY, M.D., Chairman

Report of the Delegate to the American Medical Association, Chicago, June 1948 and St. Louis, November 1948

Delegate attendance, both in Chicago and St. Louis was almost 100 per cent. The proceedings of both sessions have been so well publicized in the *Journal* of the American Medical Association, in the Secretary's letters and in special bulletins and news letters that it seems superfluous to attempt to recapitulate. Rather, certain trends and highlights of both sessions should be emphasized.

Your delegate was assigned to the reference committee which had as its major concern the Red Cross Blood Bank Program. Debate on this matter occupied some six hours of our time. The report of our reference committee was adopted by the House of Delegates. Its main recommendations were: (1) That no blood banks be established by the Red Cross without Medical Society sponsorship and professional direction and (2) That the Blook Bank Committee of the American Medical Association be instructed to meet more frequently with a similar committee from the Red Cross and agree on procedures to be followed. This action, in Chicago, should do much to remedy what was developing into a bad situation.

Rumblings of dissatisfaction with the Associated Medical Care Plans, heard in Chicago, came out into the open at St. Louis. Open hearings were held in St. Louis. The chief debate centered upon whether or not a national insurance company should be created to supervise all state and local plans and to function where no such plans were operative. The opponents of such a plan had all the best of the arguments and no such insurance company was authorized; rather, A.M.C.P. was instructed to devote its energies to coordinating and strengthening the voluntary plans now in operation and those to be formed.

Federal encroachment into the field of medical education came in for discussion and some censure when the American Academy of Pediatrics received a rebuke for having sought such aid. This may be another sign that the House of Delegates is looking at Federal subsidies as the first step in Federal control. If so, it is a very hopeful sign and points out a real danger to American Medicine.

The highlight of the St. Louis session was the voting of a voluntary assessment of twenty-five dollars each upon all physicians by the House of Delegates, the first time in the history of the American Medical Association that any assessment has been voted. Your delegate heartily supports this assessment and would add the thought that it should have been voted a number of years ago. We expected—and we got—a very "bad press" when the announcement of this assessment was first announced at St. Louis. In recent weeks, however, press and editorial comment has been changing and opposition to National Compulsory Health Insurance is growing in non-medical circles. We need more open forums, at the District Medical Society level and sponsored by District Medical Societies, where this question can be discussed with laymen in a frank and friendly manner. The question, it seems to your delegate, is not merely one of "socialized medicine" but of the creation of a Totalitarian State. If one doubts this, he would do well to read some of the recent pronouncements from Altmeyer, Ewing, et al., as to the aims of the Social Security Agency. When it is recommended, among other things, that State Workmen's Compensation insurance acts and Old Age Assistance be administered from Washington do we need to look any further for the obvious intent? Did anyone ever hear of a Bureaucracy voluntarily relinquishing power? It would seem that an Act of Congress, abolishing the present Social Security Agency and establishing in its place a physician as Secretary of Health with Cabinet rank should be one of the major objectives of those millions of American citizens who still believe in the principles of American Democracy. If I recall my history correctly, this country was founded by those who wanted to escape the tyranny of too much centralized government.

JOHN H. MOORE, M.D.

The Medical Center Advisory Council

The advisory Council of the North Dakota State Medical Center held two meetings during the past year. The first meeting was held in Grand Forks on October 5, 1948, which I was

unable to attend. This meeting was devoted entirely to a discussion of the proposed amendment to the Constitution of the State of North Dakota, providing for a special levy of one mill upon all taxable property within the State of North Dakota to produce a fund for the North Dakota State Medical Center at the University of North Dakota. A program of publicity was outlined, and ways and means of utilizing the publicity to the best advantage were agreed upon. The publicity campaign included advertisements over the radio and in the newspapers, distribution of a pamphlet which gave the reasons for voting "yes" on the proposed amendment, and a letter addressed to every physician in the state, with the pamphlet enclosed, urging him to assist in the campaign.

The amendment carried by a 23,000 majority. It was too late to spread the levy on the 1948 tax roll, and there was some question as to whether or not an appropriation bill needed to be introduced in the 1949 legislature. Accordingly, the Council met in Bismarck on January 20, 1949, to review the situation and to make recommendations to the Board of Higher Education. Your representative attended this meeting. President John C. West of the University discussed the functions of the Medical Center Advisory Council as an advisory group to the Board of Higher Education. Mr. Harry D. Keller, representative of the State Hospital Association, stressed the urgency of taking definite action to institute some of the services contemplated by the Medical Center law. Dr. R. E. Leigh, chairman of our Association's Committee on Medical Education, discussed the problems confronting the Medical Center and urged the Council to consider carefully a plan to subsidize intern training in the state as a means of attracting doctors to locate in the state. The following recommendations were made by the Advisory Council to the Board of Higher Education:

1. That the present two-year Medical School at the University of North Dakota be strengthened as soon as possible so that it may obtain the unqualified approval of recognized accrediting agencies.

2. That a study be made of ways and means by which general medical practitioners can be made available to the people of North Dakota through scholarships, stipends, and internships. After such a study, that an administrative plan be established.

3. That a study be made of means by which state-wide pathological, library, postgraduate, and psychiatric services can be made available to the people of the state.

4. That the cooperation of the League of Nursing Education, the State Nurses' Association, and the State Board of Nurse Examiners, be solicited in developing a School of Nursing on the collegiate level, at the University.

5. That the University offer courses leading to academic degrees for medical technologists and x-ray technicians.

6. That the State Medical Center cooperate with public and private health agencies to augment and implement an adequate health program for the people of the state of North Dakota.

The Council also discussed ways and means by which the money provided by the constitutional amendment could be made available to the Board of Higher Education for the purpose intended. It was agreed that the leaders of both houses of the legislature be asked to sponsor a bill at the 1949 Session which would make the funds available when they are collected in 1950. This was done and virtually a blank check was issued by the legislature for the expenditure of the fund.

The Advisory Council appears to have a sound viewpoint concerning the State Medical Center. Most of its members have been on the Council since its inception, and are thoroughly familiar with all of the problems involved. The Council agreed that the vote of the people on the constitutional amendment last November demands that every effort be made to develop the State Medical Center at Grand Forks. However, the first essential is to strengthen the present two-year school, so that it may obtain the unqualified approval of the Council on Medical Education and Hospitals of the American Medical Association. The new science building will probably be completed for use next fall, and every effort is being made by President West and Dean Potter to employ an adequate staff of qualified instructors. Further development of the State Medical Center will depend on the return from the tax levy and the continued support of the majority of the voters in the future.

L. W. Larson, M.D.

NEW BUSINESS

Report of the Committee on Resolutions

The following report of the Committee on Resolutions was referred to the Reference Committee on Resolutions and New Business:

RESOLUTION

Whereas, it is well accepted that the disease, Diabetes Mellitus, is of great importance and that the early detection of diabetes is of great value, and,

Whereas, a diabetes detection program conducted in the city of Grand Forks was very successful,

Now, therefore, be it resolved, that the House of Delegates endorse a state-wide Diabetes Mellitus Detection Program to be conducted by the individual and component medical societies in the state. It is suggested that any such program be patterned after the Grand Forks plan used in December, 1948, which plan was affiliated with the National Diabetes Detection Drive sponsored by the American Diabetes Association. It is felt that the formation of a state-wide organization will assist in the efficiency of such diabetes detection.

Be it further resolved, that the House of Delegates endorse the formation of the North Dakota Diabetes Association, Inc., as an affiliate unit of the American Diabetes Association.

* * *

The Speaker announced that he had, upon the request of various members and delegates, submitted to the Resolutions Committee resolutions to be formulated on the following subjects:

1. Socialized medicine.
2. Vote of appreciation to the City of Minot and the Northwest District Medical Society for this convention.
3. Greetings to the Woman's Auxiliary.
4. Resolution on the $25 assessment by the A.M.A.
5. Resolution on the subject matter of the approval of the I.C. Credit System.
6. Resolution on the subject matter of group insurance requested by the North American Casualty Company.
7. Resolution on the subject matter of a special form of membership for residents and fellows.

The following resolution effecting a change in the constitution and by-laws, which was introduced at the 1948 meeting and laid on the table, was then read as follows:

RESOLUTION

Whereas, it is entirely within the realm of possibility that the duly elected Speaker of the House of Delegates would be unable to serve in that capacity for various reasons, and

Whereas, there has been no provision made in the Constitution and By-Laws of the North Dakota State Medical Association for a presiding officer, in the event the Speaker would be unable to preside at the Annual Meetings of the House of Delegates, and,

Whereas, it would seem advisable that there should be a Vice-Speaker, duly elected by the House of Delegates, in the event the Speaker could not preside, who would have the same duties and privileges as the Speaker,

Be it therefore resolved: That Article 9, Section 1, of the Constitution of the North Dakota State Medical Association be amended to read as follows:

"The officers of this Association shall be a President, a President-elect, a First Vice-President, a Second Vice-President, a Secretary, a Treasurer, a Speaker of the House of Delegates, a Vice-Speaker of the House of Delegates, and ten Councillors."

* * *

It was pointed out by the Speaker that while the proposed amendment provided for the office of a Vice-Speaker, it did not provide a method for his election or appointment. After considerable discussion the Speaker ruled that the nominating committee will bring in a nomination for the office of an acting Vice-Speaker and the Committee on Resolutions will bring in a proper amendment to Section 3, Article 9, providing for a method of election of a Vice-Speaker.

Dr. Liebeler announced that the Veterinarian Association had made a request of this Association that a resolution backing them in the state Brucellosis Campaign to eliminate brucellosis in cattle be passed at this session.

All of the foregoing subjects for resolutions and resolutions were referred to the Committee on Resolutions.

The next order was the setting of the Annual Dues, which after a short discussion were set at $50.00 for the year 1949-50.

It was moved, seconded and passed, that the amendment offered at the 1948 meeting relative to the designation of an office of Vice-Speaker be adopted by this House of Delegates.

Nominating Committee

The Speaker announced the appointment of the following members to the Nominating Committee: Drs. A. D. McCannel, chairman; C. J. Meredith, C. M. Hunter, J. C. Fawcett, and R. W. Rodgers.

Adjournment

The First Session of the House of Delegates was adjourned to reconvene at 2:30 P.M., May 15, 1949. On motion of Dr. Fortney and seconded by Dr. Radl, the motion was carried and the First Session adjourned at 9:30 P.M.

SECOND SESSION OF THE HOUSE OF DELEGATES

Sunday Afternoon, May 15, 1949

The Second Session of the House of Delegates was called to order by the Speaker, Dr. A. E. Spear, at 2:30 P.M., in the Skyline Room of the Clarence Parker Hotel, Minot, North Dakota, May 15, 1949.

The Secretary called the roll. Eighteen delegates responded and the Speaker declared a quorum present. The following delegates were present:

Drs. A. C. Fortney, Fargo; E. J. Beithon, Wahpeton; E. M. Haugrud, alternate, Fargo; G. W. Toomey, Devils Lake; T. Q. Benson, Grand Forks; George Waldren, Cavalier; R. W. Vance, Grand Forks; A. K. Johnson, alternate, Williston; D. J. Halliday, Kenmare; A. R. Sorenson, Minot; M. G. Flath, Stanley; W. H. Gilsdorf, Valley City; R. B. Radl, Bismarck; V. D. Fergusson, alternate, Edgeley; R. W. Rodgers, Dickinson; P. G. Arzt, Jamestown; H. A. LaFleur, alternate, Mayville; R. F. Gilliland, Carrington.

The reading of the minutes of the first session was dispensed with on motion of Dr. A. C. Fortney, which was seconded by Dr. H. A. LaFleur and carried.

On motion of Dr. Radl, duly seconded and passed, the order of business was changed for the purpose of submitting a Resolution for adoption which would change the number of officers to be nominated for offices of this Association. The following resolution was passed on the motion of Dr. Radl, seconded by Dr. Fergusson:

Whereas, the present Councillor of the Eighth Councillor District, Dr. F. W. Fergusson, and the Alternate Delegate, Dr. V. D. Fergusson of the Southern District Medical Society have advised that it is the feeling that there are insufficient physicians present in that area for the Southern District Medical Society to function satisfactorily, and for that reason that Society requests that it be dissolved,

Now, therefore, be it resolved, that the Southern District Medical Society be dissolved, and that the constituent members thereof be entitled to the privilege of joining component medical societies in accordance with Chapter 12, Section 8, of the By-Laws.

Be it further resolved, that in accordance with the authority in Chapter 4, Section 10 of the By-Laws, that the Eighth Councillor District be dissolved as such and that its present geographic confines be included in those of the Seventh Councillor District, and that the Seventh District Councillor assume the duties and obligations previously held by the Eighth Councillor,

Be it further resolved, that the present Tenth Councillor District be numbered the Ninth Councillor District and the present Ninth Councillor District be numbered the Eighth Councillor District.

Election of Officers

Dr. C. J. Meredith, acting chairman of the Nominating Committee, presented the following report: The Speaker announced that there was nothing in the report of the committee that precluded additional nomination of officers from the floor and inquired as to whether any additional nominations were to be made. Hearing none, he declared that a motion would be in order to declare the nominees duly elected to their respective offices. On a motion made that the nominees be elected unanimously, which motion was seconded, all voted Aye and the officers were elected unanimously.

President—W. A. Wright, Williston.
President-elect—L. W. Larson, Bismarck.
First Vice-President—W. E. G. Lancaster, Fargo.
Second Vice-President—O. W. Johnson, Rugby.
Speaker of the House of Delegates—A. E. Spear, Dickinson.
Vice-Speaker of the House—G. A. Dodds, Fargo.
Secretary—O. A. Sedlak, Fargo.
Treasurer—E. J. Larson, Jamestown.
Delegate to the A.M.A.—W. A. Wright, Williston.
Alternate Delegate to A.M.A.—G. W. Toomey, Devils Lake.
Councillors (terms expiring 1952) — Second district: J. C. Fawcett, Devils Lake; Seventh district: Joseph Sorkness, Jamestown; Ninth district: A. R. Gilsdorf, Dickinson.
Recommended to the State Board of Medical Examiners—C. J. Glaspel, Grafton, N. D.; Joseph Sorkness, Jamestown; D. J. Halliday, Kenmare.
State Health Council: M. S. Jacobson, Elgin.
University Medical Center Advisory Council: L. W. Larson, Bismarck.

Selection of 1950 Meeting Place

The Speaker announced that he would be glad to entertain an invitation for a place for the 1950 meeting to be held. Dr. T. Q. Benson stated that the Grand Forks District Medical Society extends a cordial invitation for the Sixty-third Annual Meeting to be held at Grand Forks, in 1950. It was moved by Dr. Radl and seconded by Dr. Halliday that the invitation be accepted. All voted Aye.

REPORTS OF REFERENCE COMMITTEES

Reference Committee to Consider the Reports of the President, Secretary, Executive Secretary and Special Committees

Dr. G. W. Toomey, chairman, presented the following report which was adopted section by section and as a whole:

1. *Report of the President*: We all realize the diligence with which our President, Dr. W. A. Liebeler, has pursued the duties of this office. He has consistently and conscientiously spent an enormous amount of time coordinating the many branches of our Society into a smooth-functioning unit. We also all realize the responsibility of the Office of President in such trying times as these, with the many problems both scientific and economic, which are confronting the medical profession. Dr. Liebeler has obviously had an excellent understanding of these problems.

2. *Report of the Secretary*: It is gratifying to note that there has been an increase of the paid membership of the Society. However, it is obvious that the local societies have been lax in bringing pressure to bear upon a sizable number of active practitioners who do not belong to the Society. Your Secretary is to be complimented on the amount of field work he has done. The recommendations in his report are definitely endorsed by your Reference Committee.

3. *Report of Executive Secretary*: The report of the Executive Secretary is exceedingly concise and complete. There is no doubt that the office of the Executive Secretary has been run efficiently and conscientiously. Your Executive Secretary has been alert at all times and has been very prompt in informing all members of the Society of all important problems. The committee endorses the recommendation that $750 to $1,000 be included in the budget for miscellaneous items, and recommends the Council give attention to this matter.

4. *Report of Committee on Industrial Health*: Your committee has considered the report of Dr. C. J. Glaspel on Industrial Health. The committee commends the use of the form of the new death certificate which gives the Bureau of Vital Statistics more detail which may lead to a better control of accidents in industry.

5. *Report of Committee on Mental Hygiene*: The committee notes the great deal of time and effort that has been put in on the report of Dr. R. H. Breslin on Mental Hygiene. It would be well worthwhile that all members read this detailed report carefully. The committee is cognizant of the increasing importance of the field of Mental Hygiene. The committee recommends that this committee remain active.

6. *Report of Committee on Emergency Medical Service*: Your committee has considered the report of Dr. A. C. Fortney on Emergency Medical Service. The committee recommends that the membership give thought to the necessity of procurement of an adequate number of physicians for the Armed Services and that Doctors within the prescribed classification be encouraged to volunteer to enter the Service.

7. *Report of Committee on Nursing Education*: The committee has considered the report of Dr. Toomey on Nursing Education. Your chairman of this committee realized that the current problems of nursing care are no different than they have been in the past several years. However, with the present legislative set-up there is very little that the physicians as a group can do to remedy the situation. It is hoped that the admittance of displaced nurses may help to relieve the current nursing shortage. It is fortunate that we are now able to license nurses aids, thereby avoiding the stringent regulations imposed upon candidates for R.N. by the Schools of Nursing.

8. *Report of Committee on Displaced Physicians*: The report of Dr. A. C. Fortney on the Committee on Displaced Physicians is very complete and the committee should be highly commended on the expeditious and diplomatic manner in which they have handled such a delicate and highly publicized problem.

G. W. TOOMEY, M.D., Chairman
M. S. JACOBSON, M.D.
B. M. URENN, M.D.
R. B. WOODHULL, M.D.

Reference Committee to Consider the Reports of the Council, Councillors, Delegate to the A.M.A., and Member of the Medical Center Advisory Council

Dr. W. H. Gilsdorf, chairman, presented the following report, which was adopted section by section, and as a whole:

1. *Report of Chairman of the Council:* Your reference committee has reviewed the report printed in the Handbook of Dr. McCannel, chairman of the Council, and wishes to compliment the Council on the thorough manner in which a large amount of work was completed last year. We were also very pleased to review the supplemental report of Dr. McCannel for the Council meeting held May 14, 1949. This, with the Executive Secretary's Supplemental Report, brought all reports of the business of the Association up to the present date. This method will eliminate a lot of confusion in the future.

This Committe concurs most heartily with the Stutsman County Medical Society in recommending increased educational effort to combat adverse medical propaganda.

2. *Reports of Councillors*: Your Reference Committee reviewed the reports of the Councillors and noted an increase in the number and quality of meetings of most district societies. We hope this trend continues.

3. *Report of Delegates to the A.M.A.*: The report of the Delegate to the A.M.A. was read with considerable interest. Your committee encourages each member to pay the $25.00 assessment to the A.M.A. at once as a minor gesture on his part to help prevent socialized medicine.

4. *Report of Member of Medical Center Advisory Council*: Your committee reviewed the report of the Member of the Medical Center Advisory Council. The committee agrees that one of the main objects of the Advisory Council at the present time should be to strengthen the two year medical school so it may obtain the unqualified approval of recognized accrediting agencies.

W. H. GILSDORF, M.D., Chairman
H. A. LAFLEUR, M.D.
A. K. JOHNSON, M.D.

Reference Committee to Consider the Reports of the Standing Committees Except the Report of the Committee on Medical Economics and its Sub-Committees on Prepayment Medical Care, Veterans Medical Service, and Rural Health

Dr. R. W. Vance, chairman, presented the following report, which was adopted section by section, and as a whole:

1. *Report of Committee on Medical Education*: Your reference committee was impressed by the report of the Committee on Medical Education and feels they deserve to be especially commended. Your committee has also reviewed the recommendations of the Medical Center Advisory Council to the State Board of Higher Education and we feel that the next few years this should be carefully guided so that the goals set up shall be fulfilled.

2. *Report of Committee on Pneumonia*: Your reference committee moves the adoption of the report of the Committee on Pneumonia.

3. *Report of the Committee on Necrology and Medical History*: Your reference committee moves the adoption of the report on Necrology and Medical History. At that time the Speaker announced that the Chair would request the House of Delegates to rise for one moment in silent tribute to the members who have passed on. Thereupon followed a moment of silence with all delegates and guests standing.

4. *Report of Committee on Maternal and Child Welfare*: Your reference committee has reviewed the report of the Committee on Maternal and Child Welfare and moves its adoption.

5. *Report of the Committee on Cancer*: Your reference committee has reviewed the report of the Committee on Cancer and moves its adoption.

6. *Report of the Committee on Tuberculosis*: Your reference committee has reviewed the report of the Committee on Tuberculosis. Your committee feels that a report on the follow-up of the results of BCG vaccine in the Indian territory be given because of the widespread interest of this newer means of controlling tuberculosis.

7. *Report of Committee on Public Policy and Legislation*: Your reference committee wishes to compliment the Committee on Public Policy and Legislation for their untiring efforts in disposing of very controversial matters in a most satisfactory manner.

8. *Report of Committee on Crippled Children*: Your reference committee has reviewed the report of the Committee on Crippled Children and moves its adoption.

9. *Report of Committee on Public Health*: Your reference committee has reviewed the report of the Committee on Public Health and moves its adoption.

10. *Report of the Sub-Committee on Public Health—Garrison Dam Project*: Your reference committee has reviewed the report of the Sub-Committee on Public Health—Garrison Dam Project, and moves its adoption.

11. *Report of Committee on Official Publication*: Your reference committee has reviewed the report of the Committee on Official Publication and moves its adoption.

12. *Report of the Committee on Fractures*: Your reference committee has reviewed the report of the Committee on Fractures and moves its adoption.

13. *Report of the Committee on Venereal Disease*: Your reference committee notes that no report has been made on Venereal Disease.

R. W. VANCE, M.D., Chairman
GEORGE WALDREN, M.D.
F. W. FERGUSSON, M.D.
M. G. FLATH, M.D.

Reference Committee to Consider the Reports of the Committee on Medical Economics, including the Sub-Committees on Prepayment Medical Care, Veterans Medical Service and Rural Health

Dr. T. Q. Benson, chairman, presented the following report which was adopted section by section and as a whole:

1. *Report of Committee on Medical Economics as a Whole*: Your reference committee submits the following report:

Whereas, Dr. W. A. Wright as chairman of the Committee on Medical Economics has attended the following national meetings: A.M.A. Conference on Rural Medical Care; Northwest Regional Conference; National Conference on Medical Care; and National Physicians Committee, and has rendered a report in writing in an excellent manner and has also, in carefully considered paragraphs, stated the conditions as they exist in regard to the controversy between the Public Welfare Board and the physicians; namely, a refusal of the Public Welfare Board to arbitrate an adequate fee schedule, in which it is recommended that the North Dakota State Medical Association notify the Public Welfare Board that the advisory fee schedule now in effect is considered to be rescinded; and that in the future doctors in North Dakota will feel free to charge Public Welfare Board cases such fee as in their own opinion seems proper; we recommend that Dr. W. A. Wright be officially commended for his untiring efforts.

2. *Report of Sub-Committee on Prepayment Medical Care*: Your Reference Committee has reviewed the report of Dr. W. E. G. Lancaster.

Several meetings were held during the past fiscal year. At the meeting in Fargo, July 2, 1948, it was proposed that a compromise program be put into effect modifying the present plan. In Fargo, October 2, 1948, the partial income, partial indemnity plan was adopted. There has been a liberalization in the ruling that all procedures must be performed in hospitals—this is in regard to tonsillectomies, fractures and obstetrical cases.

It is recommended that the House of Delegates approve the expansion thus far of the North Dakota Physicians Service so that it may be expanded into all areas of the state of North Dakota.

3. *Report of Sub-Committee on Rural Health*: Your reference Comittee to consider the report of the Sub-Committee on Rural Health submits the following:

The reference committee agrees heartily with the plans for encouraging medical men to locate in rural areas. Plans for scholarships, internships and residencies and also plans for location of small hospitals at proper places are commendable. The Lorenzen Memorial Hospital at Elgin is given as an example of a small community hospital.

4. *Report of Sub-Committee on Veterans Medical Service*: Your reference committee has reviewed the report of Dr. R. B. Radl, chairman of the Sub-Committee on Veterans Medical Service.

It states it is the feeling of the chairman of this committee that the Veterans Medical Service Division is being well handled and efficiently, and shows progress rather than regression.

T. Q. BENSON, M.D., Chairman
P. G. ARZT, M.D.
E. M. HAUGRUD, M.D.

Speaker Spear made the following remarks directed toward the chairman and members of the reference committees: "I want to thank the chairmen and members of the committees for the thoroughness with which they have prepared their reports. These have been very short and concise, helping to make the work of this session go more smoothly and speedily."

Dr. Wright then asked for the floor to make a remark concerning the membership of the Medical Economics committee. He stated:

"This is the last year I will be serving on the Medical Economics Committee. I would like to extend my own personal thanks to the many men who have worked on this committee and sub-committees. We have had a very fine group of fellows who have put in a lot of time and work. The boys do most of the work and I seem to have received most of the credit. I would, therefore, like to put in a plug for all the men on these committees for all the time and work they have put in. The members in many instances turned out very well to meetings and it has been a real help to the affairs of the Association. I would like to extend my personal thanks to all of these fellows."

Reference Committee on Resolutions

Dr. R. B. Radl, chairman, presented the following report which was adopted section by section and as a whole:

Your Committee on Resolutions wishes to present the following resolution:

Whereas, the Sixty-second Annual Meeting of the North Dakota State Medical Association held in Minot, N. D., May 14th to 17th, presents an outstanding scientific and entertainment program,

Now, therefore, be it resolved, that the House of Delegates offer its thanks and appreciation to the Northwest District Medical Society, to the several local program and entertainment committees to Dr. Liebeler, State President, and to the city of Minot, for the contributions they have made to insure the success of this meeting.

Your Committee on Resolutions wishes to present the following resolution:

Whereas, the Women's Auxiliary of the North Dakota State Medical Association under the distinguished leadership of Mrs. Baillie of Fargo has rendered yeoman service to our Association by its support to our organization in its stand against the socialization of medicine,

Now, therefore, be it resolved, that the House of Delegates express its gratitude to the Auxiliary for its untiring efforts in behalf of the Medical Association.

Your Committee on Resolutions wishes to present the following resolution:

Whereas, the American people now enjoy the privileges of the highest level of health, the best standards of scientific medicine and the free choice of medical care,

And Whereas, the American people now enjoy the privileges of the highest level of health, the best standards of scientific medicine and the free choice of medical care,

And Whereas, the accomplishments of American medicine were attained by free people, working under a system of free enterprise,

And Whereas, the experience of all countries where government has assumed control of medical care there has been a progressive deterioration of medical standards and medical care to the detriment of the health of those people,

Now, therefore, be it resolved, that the House of Delegates assembled at this Sixty-second Annual Meeting, strongly protest to the Congress of the United States the passage of any legislation imposing upon the people of this Nation any form of compulsory health insurance, or any system of medical care designed for national bureaucratic control,

Be it further resolved, that a copy of this resolution be forwarded to the chairman of the Appropriations Committee of the United States Senate and House of Representatives, and to the Congressmen from the state of North Dakota.

Your Resolutions Committee wishes to present the following resolution:

Whereas, the President of the United States has seen fit to propose a form of compulsory medical insurance, and,

Whereas, the best efforts of the A.M.A. and the State Societies are unalterably opposed to this form of legislation, and,

Whereas, opposition to this form of bureaucracy can best be proposed by an educational program,

Now, therefore, be it resolved, that the President of the Association appoint a Public Relations Committee of at least five members to promote the educational campaign of the A.M.A. in the state of North Dakota, and that this committee be instructed to receive authority for expenditures from the Executive Committee of the Council.

Your Committee on Resolutions wishes to present the following resolution:

Whereas, an appeal has been made by the I. C. System for an endorsement by the Association for the purpose of acting as an official collecting agency for doctors,

Now, therefore, be it resolved, that the House of Delegates, as a Society, refuse this endorsement.

Your Committee on Resolutions wishes to present the following resolution:

Whereas, an endorsement for group insurance of the members of the medical society has been sought by the North American Accident Insurance Company,

Now, therefore, be it resolved, that the House of Delegates refuse this endorsement.

We wish to present the following resolution:

Whereas, the National Sales Foundation has requested an endorsement from the State Medical Association for the purpose of selling to the druggists of the state, articles and advertising relative to health programs,

Now, therefore, be it resolved, that the House of Delegates refuse the endorsement of this form of advertising.

We wish to present the following resolution:

Whereas, Aloysius P. Nachtwey has served this Association for many years as State Delegate to the A.M.A., and served one term as Speaker of the House of Delegates,

And whereas, Aloysius P. Nachtwey has served this Association faithfully and well, and

Whereas, he was loved and honored by the medical fraternity, and

Whereas, Almighty God has seen fit to take him from his labors amongst us,

Now, therefore, be it resolved, that this House of Delegates express to his bereaved wife the sincerest condolences and sympathy in the passing of her beloved husband.

The Speaker then asked all to rise for a moment of silence

in tribute to Dr. Nachtwey. All members and guest arose and a moment of silence followed.

Your Committee on Resolutions moves the adoption of the recommendation of the Council,

That the contract with the Journal-Lancet, the official publication of the North Dakota State Medical Association, be renewed for one year.

Your Committee on Resolutions wishes to present the following resolution:

Whereas, it is well accepted that the disease, Diabetes Mellitus, is of great importance, and that the early detection of diabetes is of great value, and

Whereas, a Diabetes Detection program conducted in the city of Grand Forks was very successful,

Now, therefore, be it resolved, that the House of Delegates endorse a state-wide Diabetes Mellitus detection program to be conducted by the individual and component medical societies in the state. It is suggested that any such programs be patterned after the Grand Forks plan used in December, 1948, which plan was affiliated with the National Diabetes Detection Drive sponsored by the American Diabetes Association. It is felt that the formation of a state-wide organization will assist in the efficiency of such diabetes detection.

Be it further resolved, that the House of Delegates endorse the formation of the North Dakota Diabetes Association, Inc., as an affiliate unit of the American Diabetes Association.

Your Committee on Resolutions wishes to present the following resolution:

Whereas, Brucellosis is an important disease affecting humans and animals,

Be it therefore resolved, that the House of Delegates be placed on record to give its support to any movement which would eradicate Brucellosis in cattle in the state of North Dakota.

Your Committee on Resolutions wishes to present the following resolution:

Whereas, Drs. E. P. Quain, Fannie Dunn Quain, and W. H. Bodenstab, members of the Sixth District Medical Society, and W. F. Sihler of Devils Lake, member of the Devils Lake District Medical Society, have met with the requirements of Article IV, Section 4 of the Constitution, referring to honorary members,

Now, therefore, be it resolved, that these doctors be elected to honorary membership in the State Association, and that the Secretary be instructed to notify these physicians of the honorarium.

Dr. R. B. Radl suggested that the Constitution and By-Laws be reprinted next year and that a copy of the Constitution and By-Laws be sent out to the newly elected delegates next year.

The Resolutions Committee then submitted the following proposed amendments to the Constitution:

The Committee on Resolutions wishes to submit the following Amendments to the Constitution:

Whereas, changes have been necessary regarding the number and locations of the Councillor Districts and Councillors, it is necessary to amend the Constitution, and

Whereas, it is also necessary to amend the Constitution in order that there be proper authority for the Vice-Speaker of the House of Delegates,

The following amendments to the Constitution are submitted for your consideration:

That the first sentence of Article 6, Section 1, pertaining to the Council be amended to read as follows:

"The Council shall be the Executive Body of the Association and shall consist of Nine Councillors."

After considerable discussion this proposed amendment was amended by Dr. Radl to read as follows:

Your Committee on Resolutions will submit the following Amendment:

"The Council shall be the Executive Body of the Association and shall consist of one Councillor from each Councillor District."

This amendment to the Constitution was laid on the table until the 1950 Annual Meeting.

Your Committee on Resolutions wishes to submit the following Amendment to the Constitution:

That Article 9, Section 1, pertaining to officers, be amended to read: "The officers of this Association shall be President, President-elect, a First Vice-President, a Second Vice-President, a Secretary, a Treasurer, a Speaker of the House of Delegates, a Vice-Speaker of the House of Delegates, and one Councillor from each Councillor District."

The proposed amendment to the Constitution was tabled until the 1950 Annual Meeting.

Your Committee on Resolutions wishes to submit the following Amendment to the Constitution:

That Article 9, Section 3, pertaining to officers, be amended to read as follows:

"The Speaker and the Vice-Speaker of the House of Delegates shall be elected by the House of Delegates at its Second Session each year. Each may, but need not be, elected from among the members of the House of Delegates."

This proposed amendment to the Constitution was tabled until the 1950 Annual Meeting.

It was stated by Dr. Radl that some provision should be made for members in the North Dakota State Medical Association for Residents and/or Fellows, in graduate training. Therefore, the following amendment to the Constitution is submitted for your consideration: the changes pertaining to Article 4, covering the composition of the Association to number the present Section 4, pertaining to Honorary Members, as Section 5, and that a new Section 4 be added as follows:

"Residents and/or Fellows: Residents and/or Fellows in graduate training may become Associate Members of this Association when elected as Associate Members of the Component Society of the District in which such physician lives. Such members shall be designated as Associate Members and shall enjoy the same privileges as regular members except the right to vote or be elected to office. They shall be charged no dues."

After considerable discussion and the putting of the question before the House of Delegates, the vote was in the negative and the proposed amendment to the Constitution lost.

Your Committee on Resolutions wishes to submit the following Amendments to the By-Laws:

That Chapter 6, Section 5, referring to the duties of officers, be changed to read as follows: "The Speaker, and in his absence, the Vice-Speaker, of the House of Delegates shall preside at the meetings of the House of Delegates and shall perform such duties as custom and parliamentary usage require of a presiding officer. He shall have the right to vote, only when his vote shall be the deciding vote."

That Chapter 13, referring to Amendments, be amended as follows: "These By-Laws may be amended at any Annual Session by a majority vote of all the delegates present at that session. Any such amendment may be introdcued at any session of the House of Delegates but shall be laid upon the table for that current session, but may be acted upon at any later session of the House of Delegates."

R. B. Radl, M.D., Chairman
D. J. Halliday, M.D.
E. J. Beithon, M.D.

The Speaker, Dr. Spear, expressed his appreciation to the members of the Reference Committee on Resolutions for the vast amount of work and time spent on resolutions and amendments.

Unfinished Business

The Speaker then called upon the Executive Secretary to explain the Fifty Year Club: "Numerous state associations throughout the country have felt a good deal as Dr. Waldschmidt feels, that the requirements of the American Medical Association are too great to receive the honor of becoming an honorary member. Accordingly, in order to give members of long years of practice some recognition in their state associations, quite a few of the associations have adopted these Fifty Year Clubs. There is very little difference between a Fifty Year Club Member and an Honorary Member. There is at least one requirement that can be waived. In order to become an Honorary Member of the various state associations, a doctor must have been licensed to practice medicine in the state for fifty years. However, with the Fifty Year Club, a doctor can move from one place to another; that is, from one state to another, and the time accumulates for him on that basis so that he may

become a member of the Fifty Year Club if he has practiced medicine for fifty years. The Club in North Dakota has been authorized by the Council at the January meeting. I think it is a very nice idea for those doctors who have been practicing and serving their communities for such a long while surely should be given recognition. The ceremony that is planned during the annual meeting will be very brief and I think will probably be tinged with a lot of fun, rather than being too serious. I do not believe the doctors care to have the thing made too serious. It will be handled at the banquet tomorrow night by Dr. Frank Darrow of Fargo. He will give the new members of the Fifty Year Club their charge in the manner in which he sees fit."

The Speaker concluded with the inquiry as to whether any new business or resolutions were to be brought before the House and stated "if not, your Speaker wishes to congratulate you in the highest manner possible for the very excellent cooperation he has had from every member of this House. I think you have accomplished a great deal in a remarkably short time. Let me thank you heartily for the wonderful cooperation you have given me."

Motion was made by Dr. Radl that this session of the Sixty-second Annual Meeting of the House of Delegates be adjourned.

Adjournment

The Speaker declared the House of Delegates adjourned sine die at 5:00 P.M.

SCIENTIFIC PROGRAM

Monday, May 16, 1949

Clarence Parker Hotel, Minot, N. D.

8:30 to 9:30 A.M.—Registration and Movies.

9:30 to 10:00—"Surgical Management of the Low Back Syndrome"—Dr. G. A. Kernwein, Minot.

10:00 to 10:30—Intermission. View exhibits.

10:30 to 11:00—"Cancer of the Larynx"—Dr. Jerome A. Hilger, St. Paul, Minn.

11:00 to 11:30—"Carcinoma of the Lung; Bronchial Secretion Studies in Early Diagnosis"—Dr. G. A. Dodds, Fargo.

2:00 to 2:30 P.M.—"Surgical Diseases of the Kidney"—Dr. N. O. Brink, Bismarck.

2:30 to 3:00—"The Cytologic Diagnosis of Cancer"—Dr. J. R. McDonald, Mayo Clinic, Rochester.

3:00 to 3:30—Intermission. View exhibits.

3:30 to 4:00—"Some Common Pediatric Surgical Problems"—Dr. Oswald S. Wyatt, Minneapolis.

4:00 to 4:30—"Surgical Therapy for Peptic Ulcer"—Dr. A. L. Cameron, Minot.

4:30 to 4:40—Report on the State Diabetic Detection Drive in the Grand Forks District—Dr. E. A. Haunz, Grand Forks, N. D., Chairman of State Diabetic Detection Program.

Tuesday, May 17, 1949

9:45 to 10:00 A.M.—A playing of the Ewing Interrogation on the Cloakroom of the Air.

10:00 to 10:30—Presidential Address—Dr. W. A. Liebeler, President, Grand Forks; Inaugural Address—Dr. W. A. Wright, President-elect, Williston.

10:30 to 11:00—Intermission for viewing exhibits.

11:00 to 11:30—"Headache and Head Pain"—Dr. J. J. Ayash, Minot.

11:30 to 12:00—"Surgery of the Sympathetic Nervous System"—Dr. Collin S. MacCarty, Mayo Clinic, Rochester.

12:00 Noon—Drawing for door prize.

Joint Service Club Meeting followed by Public Address of the Honorable Forest A. Harness.

Installation of President

Dr. Liebeler: I now have the pleasure of introducing to you, your next President, and so that he may well know the duties, responsibilities and the dignity that this office can give to him and which he can continue to make noble, I am going to ask Drs. Ramstad, Campbell, Bodenstab and Burton to conduct Dr. Wright to the chair.

My friend, Willard, I can not present you anything finer in this world than the office of State President of the North Dakota State Medical Association. I have never known as fine a group to deal with. You are our next President, Dr. Wright.

Dr. Wright: Thank you, Mr. President, and thank you very much, Drs. Ramstad, Campbell, Bodenstab and Burton.

Dr. W. A. Wright's Inaugural Address

I approach my term in office with some misgiving as to my ability to maintain the high standards which have been set by the sixty doctors who have preceded me.

To those who have held this office before me we owe a great debt, as of course, we do to many others, who have worked unceasingly for the good of Medicine in North Dakota. Our past Presidents have been men of dignity and stature, who have commanded the respect of the profession as a whole. It has been my pleasure to have known personally and to have counted as a real friend thirty-three of them. From these men, I have learned much and I could only wish that their combined wisdom could be ours and that we might have all of their knowledge and experience to help us in the days that lie ahead. Unfortunately, this may not be so, but I believe that we may be able to apply many of the lessons learned from these outstanding North Dakota doctors.

Without intending to imply any depreciation of the other past Presidents, I would like to single out two of them for special mention, because they are primarily responsible for me assuming this office today. From them, I received the initial stimulus and later guidance and encouragement to participate increasingly in the affairs of our Association.

My first guide and counsellor was the late Dr. Harry Brandes, a man, who at all times had the deep respect and admiration of those who were associated with him. To me, he was the perfect physician, well trained in medicine, with a keen but open scientific mind and a nice sense of discrimination. Not only was his professional work above reproach, but in addition, he displayed to a remarkable degree that desirable attribute (only too rare in doctors) of being able to meet the lay mind at its own level and to project his sound thinking into the minds of those with whom he had to deal. Anyone who had the privilege of knowing and working with Harry Brandes could not help but admire his courageous and courteous approach to medical, social and economic problems. I appreciate and seize on this opportunity to pay some slight tribute to his memory, though no words of mine could add to his lustre in the memory of his friends.

I have heard it said that a certain Minot doctor is so well known that if he were lost in the middle of the Sahara Desert, some Sheik would ride up, extend his hand and say, "Hello, Archie. What brings you here?" And if Archie McCannel were to be found in that locality, it would probably be because he was using some of his boundless energy and tremendous enthusiasm to further a good cause.

Archie has worked unceasingly for the good of North Dakota doctors, the people of North Dakota, and the city of Minot, where we are happy to be holding our 1949 Convention. He has been a good friend to all of us and for many years has provided me with stimulation, sage advice, enthusiastic support and the privilege of his friendship. For all of this, I am extremely grateful and thankful to be able to acknowledge this debt here in Minot, his home.

In other days, both the Presidents and members of the Association have always been concerned with problems, which curiously enough throughout the years have had a similar basic pattern, a struggle for control of the profession. We have always looked upon ourselves as a group of free individuals capable of directing and guiding the practice of Medicine into channels best both for patients and ourselves. This freedom, which we so prize, we do not consider as freedom to unduly exploit our fellow man, but rather as the liberty to do that which we ought to do. During the years, many persons for a variety of reasons have sought to restrict our freedom and divert control of the practice of Medicine into lay or legislative channels. Unceasingly, irregular practitioners, philanthropic foundations, some hospitals, so-called cooperatives, welfare organizations and county, state and Federal governments have worked to either assume or direct the art of healing the sick. In some instances their motives are completely selfish, and in others, they are more altruistic, but the end result of their activities would all be detrimental to the practice of our profession, at a high level of efficiency. I am sorry to say that most of these problems are still with us but the one with which we are chiefly concerned

at the present time is that of the proposed inroads on the practice of Medicine by the Federal Government.

Increasing domination by the Federal Government seems almost inevitable, because if our avowed enemies do not produce a complete program, our friends are going to produce a substitute program, which may well have somewhat the same effect. Thus, we have President Truman's proposal for straight socialized medicine, Senator Taft's of Federal subsidies to the state for the care of the indigent and Senator Hill and associates for paying voluntary health insurance premiums for those unable to pay for themselves. All of these things tend somewhat to cloud the issue but one thing is absolutely clear and that is that the profession must unite on some common ground and work unceasingly to save all that is good in private practice.

Many changes in the structure of social organizations and governments have occurred because a few determined people knew exactly what they wanted to do while the many, who were opposed to them, were unable to unite on any common basis. Nowhere has this been better expressed than by the late and unlamented Adolf Hitler, who wrote in *Mein Kampf*: "The forces in opposition to us have lacked the clearness of plan, the unity of motive and the certainty of conviction to make their cause prevail."

We, as doctors, are becoming more and more scientific and we are prone to search for the exact answers to all medical problems. We have developed technical and scientific methods of approach which are superior to anything that we have ever had before. We think that we, at all times, should have the exact diagnosis, the best method of treatment and we should apply in every case the finest that it is possible for a person to receive. This certainly is a commendable scientific method of carrying on our affairs. But, this is not the method pursued by people working in the social and economic fields. They have no mechanical or scientific criteria to guide them. They are apt to arrive at extremely unwarranted conclusions and their method of solving a given problem is too often based on an inadequate study and on considerable empiricism in the matter of the solution. This is the type of thinking with which we have to deal and it behooves us doctors not to believe that we must, before we deal with such problems, have the final and best answers.

No one solution of the medical care question is going to satisfy everyone, nor will that solution necessarily be valid for a long period of time. Changes are necessary as conditions in this country change. We must use every possible method to combat those who seek to dominate not only us, but all citizens of this country, and it is too much to expect that each one of us will agree that every proposed action is advisable, or that something that we think now is the right thing to do might not be discarded later and some other method followed. Loyal support from our members is an absolute essential and in accepting this office, I am going to ask each and every one of you to do all you can in the following year to further the best interest of our Association. I hope that all of us, wherever and whenever possible, will forego selfish interest and work for the common good of the profession in North Dakota.

Presidential Address

W. A. Liebeler, M.D., Grand Forks, North Dakota

Mr. Chairman, Members of the North Dakota State Medical Association, Ladies of the Auxiliary, and Visitors:

Belatedly, I extend to you the customary word of greeting and welcome to the fair city of Minot and to the Sixty-second Annual Meeting of this Association. This might be particularly for those whom I may have missed in my visits to rooms one, through 200, in this Hotel, the Country Club, and other places better not mentioned. But, on second thought, my remarks will be for all, for I intend to use these remaining moments in examination of our heritage and in testimonial of a group of men who served as Presidents of this Association through World War I, and are still carrying on the battle. Too often we tend to lose sight of basic values because of absorption in the problems and the fears of the day. Yes, even to the point of sometimes losing perspective.

Let's look at these men through the eyes of North Dakota's only medical historian, James Grassick. The total sum of their lives and the lives of all the others who have worked arduously for this Association has built the heritage now ours:

Dr. W. H. Bodenstab, our 15th President, 1903-1904. Said Dr. Grassick: "Dr. Bodenstab is an acknowledged authority in internal medicine, having fitted himself in this department of the healing art by investigation and study in the leading medical centers at home and abroad. His contributions to medical literature have been frequent and characterized by a thoroughness and a saneness that give them value." My own note is that he makes the best Martini in the state of North Dakota.

Dr. R. D. Campbell, our 18th President, 1906-1907. Said Dr. Grassick: "Dr. Campbell has been no laggard in his profession. In 1908 and in 1913 he went abroad and studied in the great medical centers: Berlin, Vienna, Paris, London and Edinburgh. Thus fitted, he has well fitted many positions of honor and responsibility calling for scholarship and executive ability. He has held the position of Lecturer on Surgery in the Medical School of the University of North Dakota since its organization. He is surgeon for the Great Northern and Northern Pacific Railroad Companies and a charter member of the American College of Surgeons." My note—as fine a gentleman as I ever expect to know.

Dr. J. E. Countryman, our 21st President, 1909-1910. Of him, Dr. Grassick said: "Dr. Countryman is a gentleman of good address and pleasing personality. He has made a success of his profession by keeping in close touch with the progress of medicine and surgery, by paying strict attention to the details of practice, by ethical and honorable dealings with his fellow practitioners and by painstaking and sympathetic treatment of his patients. His ideals are high and in his social, business and professional life, integrity is a controlling factor."

Dr. V. J. LaRose, our 28th President, 1916-1917. Again said Dr. Grassick: "Dr. LaRose has held so many positions of trust and responsibility that he has been 'tried as if by fire'. He is progressive and yet is so modest in his bearing among his professional associates

that the quality of the man is often hidden from view, but as the necessity arises he can always be relied upon to 'deliver the goods'. He is conscientious and thorough in his work and hates sham and superficiality in others. As a member of the profession and of the Society, Dr. LaRose ranks high."

Dr. G. M. Williamson, our 29th President, 1917-1918. Quoting Dr. Grassick: "Dr. Williamson was chairman of the committee that passed the Medical Practice Act of 1911, than which there is none better on the statute books of any state in the Union. In 1911 he was appointed as a member of the North Dakota State Board of Medical Examiners and on the organization of that body, was elected as its secretary, which position he has held continuously since that time. It is not too much to say that the burden of the work fell on his shoulders and that he has given it his best efforts and made it a model, the equal of any board of similar nature in the country. His work in the state was recognized by the Federation of State Examining Boards and he served on the Executive Committee of the National Organization from 1919 to 1922."

Our Association has been extremely fortunate in its Presidents of the past. With scarcely an exception, they have been not only of the highest standings in their profession, but men who would have graced any position of trust or responsibility to which they might have aspired. We can truthfully say, and we do, with some pride, "We have been captained well."

It is these men and the others who have gone before us who have set the high standards of medical practice in the state of North Dakota. Some of them were responsible for the establishment and success of the University of North Dakota School of Medicine and gave directly of their time as lecturers. It is up to us to carry the school forward. We are on the verge of great new realizations in this respect. The one mill levy has provided a system of adequate and permanent finance for the school. We must see to it that plans are adopted to provide the best possible medical education for the benefit of both the students and the people of the state of North Dakota. In passing, one cannot omit reference to Dr. H. E. French, Dean Emeritus. His stamp will forever be found on the institution. His unselfish devotion has carried the school through long years of impossibly inadequate finance, with the result that the reputation of his graduates have ranked among the best in the land.

One hears a lot about "group practice" these days. Men before us in North Dakota have been pioneers in that field. Group practice has been common in Medical Center Areas in North Dakota for several decades. Today one witnesses large clinics with fine buildings and fine equipment in all of the large centers of the state. It is stated by many individuals and groups of individuals, both patients and professional men, that group practice is the only means for supplying adequate medical care. This, like so many broad generalizations, I believe to be an over-simplification of the problem. Both individual and group practice definitely have their place in North Dakota. The very satisfactory balance achieved between the two in this state has resulted in a quality of medical care which is difficult to surpass anywhere in the United States. We are further fortunate in the rather excellent balance between general practitioners and specialists located here.

Still others of our great group of leaders have lent their abilities to the establishment and guidance of the North Dakota State Board of Medical Examiners, a body charged with the great duty and responsibility of seeing to it that only those of high competency and moral qualifications be permitted to practice in North Dakota. The present board meets its obligations well. It has been recognized probably more acutely by physicians than even the public that a physician shortage occurred both during the war years and the years that followed. The board has been anxious that new men come to the state—but only well qualified men. Their handling of the problem of the Displaced Physician is well illustrative of the fact. It is further most encouraging to note the large number of well trained American physicians who are being atracted to our state.

All of these things bode well for the future of the practice of medicine in North Dakota. High quality of care, service, and integrity must always be the goal of all of us. With the realization of the goal our patients will be with us in all we stand for.

The Woman's Auxiliary has grown to adult dimensions and, with the ardent enthusiasm I have seen displayed this past year, we may with certainty depend on this fine organization to continue aid in educating their friends and organizations in a good for all concerned. And I do not mean the medical profession and their families, but the people of their acquaintance who may be and are being misinformed by professional bureaucracies.

May I congratulate and thank the Woman's Auxiliary for their splendid cooperation and achievement.

Perhaps I should mention the A.M.A. National Campaign to educate and set right the thought of many individuals. Apparently, they have seen fit to educate the physicians first with the real facts and the sinister methods that some of our electors have seen fit to use in distorting the ideas and thoughts of the American public. I hope in the near future we will be thoroughly acquainted with the facts and be able to turn our efforts to others who may not be as fortunate to learn the truth as we have been.

The American way is the way in which we have gained our position as the greatest nation in the World. It will read a few paragraphs from a talk given by DeWitt Emery, President of the National Small Business Men's Association:

"Our American Way of Life is made up of many things—bathtubs and automobiles; big cities and small towns; farms and victory gardens; mammoth steel mills and village machine shops; colossal educational institutions and the little red schoolhouse beside the road; churches and hospitals; railroads and airlines; chewing gum and ice cream; department stores and crossroad general stores; specialty shops and beauty parlors; pool rooms and race tracks; Hollywood, Broadway and the

Highschool play; laughter and sorrow; eagerness and despair; and people—millions of all kinds of people—gathered together from the four corners of the earth, drawn by the magnet of Freedom, Opportunity and Justice.

"Our American Way of Life provides each individual an opportunity to go as far and climb as high as his willingness to work, his skill, ingenuity and integrity will carry him.

"Our American Way of Life recognizes that the individual has the right to work when and where he wishes, the right to worship as he pleases, to speak his mind on any subject, to meet with his fellow men for any peaceful purpose, to be secure in his possessions and to have his day in a free court. It recognizes that the individual is superior to the State, that our public officials are servants of the people and that they derive their just powers from the consent of the people.

"These things taken together created the atmosphere of freedom and an economic climate which made possible in the United States the greatest production of wealth in the history of the world and the establishment of a standard of living which is the envy of all other nations in the world.

"In short, the American Way of Life is the greatest blessing ever bestowed on mankind any place on the face of the earth."

Now I quote from an article written by Mr. J. C. Penney:

"Two streams of thought united to produce the American Republic. One stream took its rise in the teachings of Socrates and Aristotle. These men taught that the human is and should be free; that a man has the inalienable right to think for himself; and should not be coerced intellectually. Aristotle warned that democracy can degenerate into tyranny. The demagogue, with his ability to excite the passions of the crowd with vague promises of material things, may lure them away from freedom.

"This is exactly what happened in ancient Rome. The greatest exponent of Greek thought in the Roman Empire was Marcus Cicero, who as consul of the Republic of Rome crushed the Cataline Rebellion when the left-wing forces of the Empire sought to establish a collective economy. The speeches of Cicero's opponents read exactly like the demogogic harrangues of the present day. He held them off for awhile, but they finally defeated him under the adroit manipulation of one of the shrewdest politicians who ever lived, Julius Caesar.

"Caesar told the people he would give them anything they wanted without their working for it, and they believed him. He instituted a planned economy—in fact, one planned economy after the other, because each of them in turn failed—until there came a time when 20 per cent of the population of Rome was on the public payroll. (No wonder Caesar stayed in office.) Taxes became so high that the farmers, unable to pay them, had no alternative but to allow their farms to revert to the state. This exorbitant taxation ruined business. Thousands of formerly prosperous merchants became mendicants upon the streets of Rome.

"The economic confusion deepened, currency inflation developed, and there was a vast unemployment. Collective farming was attempted, but it was impossible to induce the people to work because the government had taken care of them so long and so completely that they had lost the habits of labor. A deterioration in character followed. Men who once roared like lions for liberty, now bleated like sheep for security."

As a result, a darkness settled down upon the world, known historically as the Dark Ages.

Laws are being proposed before the Congress of the United States clearly designed to undermine our system of free enterprise and when one delves below the surface, one soon realizes they are smug schemes to take industry of private individuals and companies, and turn it over to the government. One of these measures is the Wagner-Murray-Dingle Bill.

Let not the other professions, the business men, large or small, the farmers and even those who are so-called laborers be fooled that they are not included in the scheme of present-day Caesars and group of professional bureaucrats who wish to establish themselves as saviors without apparent study of existing history and fact.

In the words of Abraham Lincoln, shortly after a bloody war to establish a freedom: "Surely every man has as strong a motive now to preserve our liberties as each had then to establish them."

Let us again pledge ourselves, here and now, to keep our profession clean, noble and good. To ever aspire that we here in America will continue to work to the end that this nation will maintain its kindliness to the human individual and lead a struggling, tired, confused world to happiness by cooperation and the contributions of our great profession.

North Dakota State Medical Association Roster-1949

MEMBERSHIP BY DISTRICTS

First District

Heilman, C. O., Pres.	Fargo
Bond, J. H., Sec.	Fargo
Bacheller, S. C.	Enderlin
Baillie, W. F.	Fargo
Baird, J. A.	Fargo
Bakke, H.	Lisbon
Bateman, C. V.	Wahpeton
Beithon, E. J.	Wahpeton
Beltz, M. E.	Wahpeton
Bond, J. H.	Fargo
Borland, V. G.	Fargo
Burt, A. C.	Fargo
Burton, P. H.	Fargo
Clark, I. D., Jr.	Casselton
Corbus, B. C.	Fargo
Darner, C. B.	Fargo
Darrow, F. I. (Rtd.)	Fargo
Darrow, K. E.	Fargo
DeCesare, F. A.	Fargo
Dillard, J. R.	Fargo
Dodds, G. A.	Fargo
Elofson, C. E.	Fargo
Fjelde, J. H.	Fargo
Fortin, H. J.	Fargo
Fortney, A. C.	Fargo
Foster, G. C.	Fargo
Geib, Marvin	Fargo
Gronvold, F. O.	Fargo
Hanna, J. F.	Fargo
Haugrud, E. M.	Fargo
Hawn, H. W.	Fargo
Heilman, C. O.	Fargo
Hunter, C. M.	Fargo
Hunter, G. W.	Fargo
Huntley, H. B.	Kindred
Ivers, G. U.	Fargo
Joistad, A. H. (Rtd.)	Fargo
Klein, A. L.	Fargo
Lancaster, W. E. G.	Fargo
Larson, G. A.	Fargo
LeMar, John	Fargo
Lewis, A. K.	Fargo
Lewis, T. H.	Fargo
Long, W. H.	Fargo
Mazur, B. A.	Fargo
Miller, H. W.	Casselton
Moe, A. E.	Fargo
Morris, A. C.	Fargo
Nichols, A. A.	Fargo
Nichols, W. C.	Fargo
Oftedal, Trygve	Fargo
Poindexter, M. H., Jr.	Fargo
Pray, L. G.	Fargo
Richter, E. H.	Hunter
Rogers, R. G.	Fargo
Sand, Olaf (Rtd.)	Fargo
Schleinitz, F. B.	Hankinson
Schneider, J. F.	Fargo
Sedlak, O. A.	Fargo
Stafne, W. A.	Fargo
Swanson, J. C.	Fargo
Tainter, Rolfe	Fargo
Thompson, Andrew M.	Wahpeton
Tronnes, Nels (Rtd.)	Fargo
Urenn, B. M.	Fargo

First—(Continued)

Veitch, Abner	Lisbon
Watson, E. M. (Rtd.)	Fargo
Weible, R. D.	Fargo
Wasemiller, E. R.	Wahpeton
Miller, H. H.	Wahpeton

Devils Lake

Mahoney, J. H., Pres.	Devils Lake
Fawcett, D. W., Sec.	Devils Lake
Engesather, J. A. D.	Brocket
Fawcett, D. W.	Devils Lake
Fawcett, J. C.	Devils Lake
Fawcett, R. M.	Devils Lake
Fox, W. R.	Rugby
Gerber, L. S.	Lakota
Horsman, A. T. (Hon.)	Dunseith
Johnson, C. G.	Rugby
Jones, E. A.	Liverpool, Eng.
Keller, E. T.	Rugby
MacDonald, J. A.	Cando
Mahoney, J. H.	Devils Lake
Miles, A. M.	Rolla
Palmer, D. W.	Cando
Sihler, W. F. (Hon.)	Devils Lake
Smith, Clinton	Devils Lake
Stickelberger, J. S. (Rtd.)	Oberon
Toomey, G. W.	Devils Lake
Van Lier, P. C.	Rugby
Vigeland, G. N.	Maddock

Grand Forks

Youngs, N. A., Pres.	Grand Forks
Silverman, L. B., Sec.	Grand Forks
Alger, L. J.	Grand Forks
Benson, T. Q.	Grand Forks
Benwell, H. D.	Grand Forks
Brown, B. E. (Rtd.)	Grand Forks
Brown, G. F.	Grand Forks
Burrows, F. N. (Hon.)	Bathgate
Campbell, R. D. (Hon.)	Grand Forks
Caveny, K. P.	Portland, Ore.
Countryman, G. L.	Grafton
Countryman, J. E. (Hon.)	Arch Cape, Ore.
Culmer, A. E., Jr.	Grand Forks
Dailey, W. C.	Grand Forks
Deason, F. W.	Grafton
Field, A. B. (Hon.)	Forest River
Flaten, A. N.	Edinburg
French, H. E.	Grand Forks
Fritzell, K. E.	Grand Forks
Glaspel, C. J.	Grafton
Goehl, R. O.	Grand Forks
Graham, C. M.	Grand Forks
Graham, John	Grand Forks
Grinnell, E. L.	Grand Forks
Hardy, N. A.	Minto
Haugen, C. O.	Larimore
Haunz, E. A.	Grand Forks
Jenson, A. F.	Grand Forks
Johann, O. P.	Grafton
Lamont, J. G.	Grafton
Landry, L. H.	Walhalla
Leigh, R. E.	Grand Forks
Liebeler, W. A.	Grand Forks

Grand Forks—(Continued)

Lohrbauer, L. T.	Grand Forks
Lommen, C. E.	Fordville
Mahowald, R. E.	Grand Forks
Moore, J. H.	Grand Forks
Mulligan, V. A.	Langdon
Muus, J. M.	McVille
Muus, O. H.	Grand Forks
Olson, P. A.	Grand Forks
Panek, A. F.	Milton
Peake, F. Margaret	Grand Forks
Piltingsrud, H. R.	Park River
Quale, V. S.	Grand Forks
Ralston, Lloyd S.	Larimore
Rand, C. C.	Grafton
Ruud, H. O.	Grand Forks
Ruud, M. B.	Grand Forks
Saiki, A. K.	Grand Forks
Sandmeyer, J. A.	Grand Forks
Silverman, L. B.	Grand Forks
St. Clair, R. T.	Northwood
Sterns, Donald	Grand Forks
Stratte, J. J.	Grand Forks
Strom, A. D.	Langdon
Thorgrimson, G. G.	Grand Forks
Tompkins, C. R.	Grafton
Turner, R. C.	Grand Forks
Vance, R. W.	Grand Forks
Waldren, G. R.	Cavalier
Waldren, H. M., Jr.	Drayton
Weed, F. E.	Park River
Williamson, G. M. (Hon.)	Grand Forks
Witherstine, W. H.	Grand Forks
Woutat, P. H.	Grand Forks
Youngs, N. A.	Grand Forks

Kotana

Johnson, A. K., Pres.	Williston
Hagan, E. J., Sec.	Williston
Carlson, R. J.	Watford City
Craven, J. D.	Williston
Craven, J. P.	Williston
Hagan, E. J.	Williston
Johnson, A. K.	Williston
Johnson, P. O. C.	Watford City
Korwin, J. J.	Williston
Lund, C. M.	Williston
McPhail, C. O.	Crosby
Wright, W. A.	Williston

Northwest

Garrison, M. W., Pres.	Minot
Kermott, L. Henry, Sec.	Minot
Ball, W. J.	Minot
Barris, R. W.	Minot
Beck, Charles	Harvey
Bethea, R. O., Jr.	Minot
Blatherwick, Robert	Parshall
Blatherwick, W. E.	Sanish
Breslich, P. J.	Minot
Cameron, A. L.	Minot
Combs, A. B.	Minot
Conroy, M. P.	Minot
Carise, O. S.	Towner
Devine, J. L., Jr.	Minot

Northwest—(Continued)

Devine, J. L., Sr.	Minot
Duane, T. D.	Minot
Dyson, R. E.	Minot
Erenfeld, F. R.	Minot
Fischer, V. J.	Minot
Flath, M. G.	Stanley
Gammell, R. T.	Kenmare
Garrison, M. W.	Minot
Goodman, Robert	Powers Lake
Greene, E. E.	Westhope
Haas, W. R.	Minot
Halliday, D. J.	Kenmare
Halverson, C. H.	Minot
Halverson, Henry L.	Minot
Hammargren, A. F.	Harvey
Hurly, W. C.	Minot
Ayash, J. J.	Minot
Ingalls, C. L.	Minot
Johnson, H. Paul	Minot
Johnson, J. A.	Bottineau
Johnson, O. W.	Rugby
Kermott, L. Henry	Minot
Kermott, Louis H.	Minot
Kernwein, G. A.	Minot
Knudson, K. O.	Glenburn
Kositsky, A.	Chicago, Ill.
Lampert, M. T.	Minot
Livingston, N. B., Jr.	Mohall
McCannel, A. D.	Minot
McCannel, M. A.	Minneapolis, Minn.
McGauvran, T. E.	Minot
Malvey, Kenneth	Bottineau
Naegeli, F. D.	Minot
Nelson, L. F.	Robbinsdale, Minn.
Neve, H. E.	Rolette
Peabody, C. S.	Minot
Ransom, E. M.	Minot
Rowe, P. H.	Minot
Seiffert, G. S.	Minot
Sorenson, A. R.	Minot
Sorenson, Rodger	Minot
Spomer, J. P.	Minot
Timm, J. F. (Hon.)	Portland, Ore.
Uthus, O. S.	Minot
Wall, W. W.	Minot
Wallbank, W. L.	San Haven
Wheelon, F. E.	Minot
Woodhull, R. B.	Minot

Sheyenne Valley

Merrett, J. P., Pres.	Valley City
Meredith, C. J., Sec.	Valley City
Almklov, L.	Cooperstown
Christianson, G.	Valley City
Cook, P. T.	Valley City
Gilsdorf, W. H.	Valley City
Macdonald, A. C.	Valley City
Macdonald, A. W. (Hon.)	Valley City
Meredith, C. J.	Valley City
Merrett, J. P.	Valley City
Van Houten, J.	Valley City
Westley, K. F.	Cooperstown
Wicks, F. L.	Valley City

Sixth

Buckingham, T. W., Pres.	Bismarck
Peters, C. H., Sec.	Bismarck
Arneson, C. A.	Bismarck
Bahamonde, J. M.	Elgin

Sixth—(Continued)

Baumgartner, C. J.	Bismarck
Benson, O. T.	N. Hollywood, Calif.
Berg, H. M.	Bismarck
Bertheau, H. J.	Linton
Bixby, Harriet	Bismarck
Blumenthal, Philip	Mandan
Bodenstab, W. H. (Hon.)	Bismarck
Boerth, E. H.	Bismarck
Breslin, R. H.	Mandan
Brink, N. O.	Bismarck
Buckingham, T. W.	Bismarck
Cartwright, John	Bismarck
Cochran, R. B.	Bismarck
Constans, G. M.	Bismarck
Craychee, W. A.	Mandan
Dahlen, G. A.	Bismarck
DeMoully, O. M.	Flasher
Diven, W. L.	Bismarck
Driver, Donn R.	Fargo
Enders, W. R.	Hazen
Fredricks, L. H.	Bismarck
Freise, P. W.	Bismarck
Gaebe, O. C.	New Salem
Griebenow, F. F.	Bismarck
Grorud, A. C.	Bismarck
Heinzeroth, George	Turtle Lake
Henderson, R. W.	Bismarck
Hetzler, A. E.	Mandan
Hill, F. J.	Minneapolis, Minn.
Icenogle, G. D.	Bismarck
Jacobson, M. S.	Elgin
LaRose, V. J. (Rtd.)	Bismarck
Larson, L. W.	Bismarck
Lipp, G. R.	Bismarck
Monteith, George	Hazelton
Nuessle, R. F.	Bismarck
Orr, A. C.	Bismarck
Owens, P. L.	Bismarck
Perrin, E. D.	Bismarck
Peters, C. H.	Bismarck
Pierce, W. B.	Bismarck
Quain, E. P. (Hon.)	Eugene, Ore.
Quain, F. D. (Hon.)	Bismarck
Radl, R. B.	Bismarck
Ramstad, N. O. (Rtd.)	Bismarck
Roan, M. W. (Rtd.)	Bismarck
Rosenberger, H. P.	Bismarck
Salomone, E.	Elgin
Saxvik, R. O.	Bismarck
Schoregge, C. W.	Bismarck
Schoregge, R. D.	Bismarck
Smith, C. C.	Mandan
Spielman, George	Mandan
Thompson, Arnold	Bismarck
Vinje, E. G.	Hazen
Vinje, Ralph	Beulah
Vonnegut, F. F.	Linton
Waldschmidt, R. H.	Bismarck
Weyrens, P. J.	Hebron
Wheeler, H. A.	Mandan

Southern

Wolfe, F. E., Pres.	Oakes
Meunier, H. J., Sec.	Oakes
Fergusson, F. W.	Kulm
Fergusson, V. D.	Edgeley
Lynde, Roy	Ellendale
Maloney, B. W.	LaMoure
Meunier, H. J.	Oakes
Van Houten, R. W.	Oakes
Wolfe, F. E.	Oakes

Southwestern

Gumper, A. J., Pres.	Dickinson
Reichert, H. L., Sec.	Dickinson
Bowen, J. W.	Dickinson
Bush, C. A.	Beach
Drury, Omer H.	Beach
Dukart, C. R.	Dickinson
Dukart, Ralph	Dickinson
Gilsdorf, A. R.	Dickinson
Goulding, R. L.	Bowman
Guloien, H. E.	Dickinson
Dach, J. L.	Hettinger
Smith, Oscar M.	Killdeer
Gumper, A. J.	Dickinson
Hill, S. W.	Regent
Maercklein, O. C. (Rtd.)	Mott
Olesky, E.	Mott
Reichert, D. J.	Dickinson
Reichert, H. L.	Dickinson
Rodgers, R. W.	Dickinson
Schumacher, N. W. (Rtd.)	Hettinger
Spanjers, A. J.	Dickinson
Spear, A. E.	Dickinson
Vogl, Charles	Miles City, Mont.
Larsen, H. C.	Dickinson
Schumacher, Wm. A.	Hettinger

Stutsman

Elsworth, J. N., Pres.	Jamestown
Nierling, R. D., Sec.	Jamestown
Arzt, P. G.	Jamestown
Carpenter, G. S.	Jamestown
Culbert, M. H. (Rtd.)	Medina
Cuthbert, W. H.	Jamestown
Elsworth, J. N.	Jamestown
Fisher, A. M.	Jamestown
Gerrish, W. A. (Hon.)	Jamestown
Holt, G. H.	Jamestown
Jansonius, J. W.	Jamestown
Larson, E. J.	Jamestown
Lucy, R. E.	Jamestown
McFadden, R. L.	Jamestown
Martin, C. S.	Kensal
Miles, James V.	Jamestown
Nierling, R. D.	Jamestown
Pederson, T. D.	Jamestown
Sorkness, Joseph	Jamestown
Wood, W. W.	Jamestown
Woodward, F. O.	Jamestown
Woodward, R. S.	Jamestown

Traill-Steele

LaFleur, H. A., Pres.	Mayville
Vinje, Syver, Sec.	Hillsboro
Cable, T. M.	Hillsboro
Cleary, H. G.	Northwood
Dekker, O. D.	Finley
Kjelland, A. A.	Hatton
Knutson, O. A.	Buxton
LaFleur, H. A.	Mayville
Little, R. C.	Mayville
Savre, M. T.	Northwood
Vinje, Syver	Hillsboro

Tri-County

Voglewede, W. C., Pres.	Carrington
Boyum, Lowell E.	Harvey
Boyum, P. A.	Harvey
Gilliland, R. F.	Carrington
Owens, C. G.	New Rockford
Schwinghamer, E. J.	New Rockford
Voglewede, Wm. C.	Carrington

Roster, North Dakota State Medical Association-1949

Alger, L. J. — Grand Forks
Almklov, L. — Cooperstown
Arneson, C. A. — Bismarck
Arzt, P. G. — Jamestown
Ayash, J. J. — Minot
Bacheller, S. C. — Enderlin
Bahamonde, J. M. — Elgin
Baillie, W. F. — Fargo
Baird, J. A. — Fargo
Bakke, H. — Lisbon
Ball, W. J. — Minot
Bateman, C. V. — Wahpeton
Baumgartner, C. — Bismarck
Beck, C. A. — Harvey
Beithon, E. J. — Wahpeton
Beltz, M. E. — Wahpeton
Benson, O. T. — N. Hollywood, Calif.
Benson, T. Q. — Grand Forks
Benwell, H. D. — Grand Forks
Berg, H. M. — Bismarck
Bertheau, H. J. — Linton
Bethea, R. O., Jr. — Minot
Bixby, Harriet — Bismarck
Blatherwick, Robert — Parshall
Blatherwick, W. E. — Sanish
Blumenthal, Philip — Mandan
Bodenstab, W. H. (Hon.) — Bismarck
Boerth, E. H. — Bismarck
Bond, J. H. — Fargo
Borland, V. G. — Fargo
Bowen, J. W. (Rtd.) — Dickinson
Boyum, L. E. — Harvey
Boyum, P. A. — Harvey
Breslich, P. J. — Minot
Breslin, R. H. — Mandan
Brink, N. O. — Bismarck
Brown, Bernice E. (Rtd.) — Grand Forks
Brown, G. F. — Grand Forks
Buckingham, T. W. — Bismarck
Burrows, F. N. (Hon.) — Bathgate
Burt, A. C. — Fargo
Burton, P. H. — Fargo
Bush, C. A. — Beach
Parris, R. W. — Minot
Cable, T. M. — Hillsboro
Cameron, A. L. — Minot
Campbell, R. D. (Hon.) — Grand Forks
Carlson, R. J. — Watford City
Carpenter, G. S. — Jamestown
Cartwright, John — Bismarck
Caveny, K. P. — Portland, Ore.
Christianson, G. — Valley City
Clark, I. D., Jr. — Casselton
Cleary, H. G. — Northwood
Cochran, R. B. — Bismarck
Combs, A. B. — Minot
Conroy, M. P. — Minot
Constans, G. M. — Bismarck
Cook, P. T. — Valley City
Corbus, B. C. — Fargo
Countryman, G. L. — Grafton
Countryman, J. E. (Hon.) — Arch Cape, Ore.
Craise, O. S. — Towner
Craven, J. D. — Williston
Craven, J. P. — Williston
Craychee, W. A. — Mandan
Culbert, M. H. — Medina
Culmer, A. E., Jr. — Grand Forks
Cuthbert, W. H. — Jamestown
Dahlen, G. A. — Bismarck
Dailey, W. C. — Grand Forks
Darner, C. B. — Fargo
Darrow, F. I. (Rtd.) — Fargo
Darrow, K. E. — Fargo
Deason, F. W. — Grafton
DeCesare, F. A. — Fargo
Dekker, O. D. — Finley
DeMoully, O. M. — Flasher
Devine, J. L., Sr. — Minot
Devine, J. L., Jr. — Minot
Dillard, J. R. — Fargo
Diven, W. L. — Bismarck
Dodds, G. A. — Fargo
Driver, D. R. — Fargo
Drury, O. H. — Beach
Duane, T. D. — Minot
Dukart, C. R. — Dickinson
Dukart, Ralph — Dickinson
Dyson, R. E. — Minot
Dach, J. L. — Hettinger
Elofson, C. E. — Fargo
Elsworth, J. N. — Jamestown
Engesather, J. A. D. — Brocket
Erenfeld, F. R. — Minot
Enders, W. R. — Hazen
Fawcett, D. W. — Devils Lake
Fawcett, J. C. — Devils Lake
Fawcett, R. M. — Devils Lake
Fergusson, F. W. — Kulm
Fergusson, V. D. — Edgeley
Field, A. B. (Hon.) — Forest River
Fischer, V. J. — Minot
Fisher, A. M. — Jamestown
Fielde, J. H. — Fargo
Flaten, A. N. — Edinburgh
Flath, M. G. — Stanley
Fortin, H. J. — Fargo
Fortney, A. C. — Fargo
Foster, G. C. — Fargo
Fox, W. R. — Rugby
Fredricks, L. H. — Bismarck
Freise, P. W. — Bismarck
French, H. E. — Grand Forks
Fritzell, K. E. — Grand Forks
Gaebe, O. C. — New Salem
Gammell, R. T. — Kenmare
Garrison, M. W. — Minot
Geib, M. J. — Fargo
Gerber, L. S. — Lakota
Gerrish, W. A. (Hon.) — Jamestown
Gilliland, R. F. — Carrington
Gilsdorf, A. R. — Dickinson
Gilsdorf, W. H. — Valley City
Glaspel, C. J. — Grafton
Goehl, R. O. — Grand Forks
Goodman, Robert — Powers Lake
Goulding, R. L. — Bowman
Graham, C. M. — Grand Forks
Graham, John — Grand Forks
Greene, E. E. — Westhope
Griebenow, F. F. — Bismarck
Grinnell, E. L. — Grand Forks
Gronvold, F. O. — Fargo
Grorud, A. C. — Bismarck
Guloien, H. E. — Dickinson
Gumper, A. J. — Dickinson
Haas, W. R. — Minot
Hagan, E. J. — Williston
Halliday, D. J. — Kenmare
Halverson, C. H. — Minot
Halverson, H. L. — Minot
Hammargren, A. F. — Harvey
Hanna, J. F. — Fargo
Hardy, N. A. — Minto
Haugen, C. O. — Larimore
Haugrud, E. M. — Fargo
Haunz, E. A. — Grand Forks
Hawn, H. W. — Fargo
Heilman, C. O. — Fargo
Heinzeroth, G. E. — Turtle Lake
Henderson, R. W. — Bismarck
Hetzler, A. E. — Mandan
Hill, F. J. — Minneapolis, Minn.
Hill, S. W. — Regent
Holt, G. H. — Jamestown
Horsman, A. T. (Hon.) — Dunseith
Hunter, C. M. — Fargo
Hunter, G. W. — Fargo
Huntley, H. B. — Kindred
Hurly, W. C. — Minot
Icenogle, G. D. — Bismarck
Ingalls, C. L. — Minot
Ivers, G. U. — Fargo
Jacobson, M. S. — Elgin
Jansonius, J. W. — Jamestown
Jensen, A. F. — Grand Forks
Johann, O. P. — Grafton
Johnson, A. K. — Williston
Johnson, C. G. — Rugby
Johnson, H. P. — Minot
Johnson, J. A. — Bottineau
Johnson, O. W. — Rugby
Johnson, P. O. C. — Watford City
Joistad, A. H. — Fargo
Jones, E. A. — Liverpool, Eng.
Keller, E. T. — Rugby
Kermott, L. Henry — Minot
Kermott, Louis H. — Minot
Kernwein, G. A. — Minot
Kjelland, A. A. — Hatton
Klein, A. L. — Fargo
Knudson, K. O. — Glenburn
Knutson, O. A. — Buxton
Korwin, J. J. — Williston
Kositsky, A. — Chicago, Ill.
LaFleur, H. A. — Mayville
Lamont, J. G. — Grafton
Lampert, M. T. — Minot
Lancaster, W. E. G. — Fargo
Landry, L. H. — Walhalla
LaRose, V. J. (Rtd.) — Bismarck
Larson, E. J. — Jamestown
Larson, G. A. — Fargo
Larson, L. W. — Bismarck
Leigh, R. E. — Grand Forks
LeMar, John — Fargo
Lewis, A. K. — Fargo
Lewis, T. H. — Fargo
Liebeler, W. A. — Grand Forks
Lipp, G. R. — Bismarck
Little, R. C. — Mayville
Livingston, N. B., Jr. — Mohall
Lohrbauer, L. T. — Grand Forks
Lommen, C. E. — Fordville
Long, W. H. — Fargo
Lucy, R. E. — Jamestown
Lund, C. M. — Williston
Lynde, Roy — Ellendale
Larsen, H. C. — Dickinson
McCannel, A. D. — Minot
McCannel, M. A. — Minneapolis, Minn.

McFadden, R. L. Jamestown
McGauvran, T. E. Minot
McPhail, C. O. Crosby
Macdonald, A. C. Valley City
Macdonald, A. W. (Hon.) Valley City
MacDonald, J. A. Cando
Maercklein, O. C. (Rtd.) Mott
Mahoney, J. H. Devils Lake
Mahowald, R. E. Grand Forks
Maloney, B. W. LaMoure
Malvey, Kenneth Bottineau
Martin, C. S. Kensal
Mazur, B. A. Fargo
Meredith, C. J. Valley City
Merrett, J. P. Valley City
Meunier, H. J. Oakes
Miles, A. M. Rolla
Miles, J. V. Jamestown
Miller, H. W. Casselton
Moe, A. E. Fargo
Monteith, George Hazelton
Moore, J. H. Grand Forks
Morris, A. C. Fargo
Mulligan, V. A. Langdon
Muus, J. M. McVille
Muus, O. H. Grand Forks
Miller, H. H. Wahpeton
Naegeli, F. D. Minot
Nelson, L. F. Robbinsdale, Minn.
Neve, H. E. Rolette
Nichols, A. A. Fargo
Nichols, W. C. Fargo
Nierling, R. D. Jamestown
Nuessle, R. F. Bismarck
Oftedal, Trygve Fargo
Olesky, E. Mott
Olson, P. A. Grand Forks
Orr, A. C. Bismarck
Owens, C. G. New Rockford
Owens, P. L. Bismarck
Palmer, D. W. Cando
Panek, A. F. Milton
Peabody, C. S. Minot
Peake, F. Margaret Grand Forks
Pederson, T. D. Jamestown
Perrin, E. D. Bismarck
Peters, Clifford Bismarck
Pierce, W. B. Bismarck
Piltingsrud, H. R. Park River
Poindexter, M. H. Fargo
Pray, L. G. Fargo
Quain, E. D. (Hon.) Salem, Ore.
Quain, F. D. (Hon.) Bismarck
Quale, V. S. Grand Forks
Radl, R. B. Bismarck
Ralston, L. S. Larimore
Ramstad, N. O. (Rtd.) Bismarck
Rand, C. C. Grafton
Ransom, E. M. Minot
Reichert, D. J. Dickinson
Reichert, H. L. Dickinson
Richter, E. H. Hunter
Roan, M. W. (Rtd.) Bismarck
Rodgers, R. W. Dickinson
Rogers, R. G. Fargo
Rosenberger, H. P. Bismarck
Rowe, P. H. Minot
Ruud, H. O. Grand Forks
Ruud, M. B. Grand Forks
Saiki, A. K. Grand Forks
Salomone, E. J. Elgin
Sand, Olaf (Rtd.) Fargo
Sandmeyer, J. A. Grand Forks
Savre, M. T. Northwood
Saxvik, R. O. Bismarck
Schleinitz, F. B. Hankinson
Schneider, J. F. Fargo
Schoregge, C. W. Bismarck
Schoregge, R. D. Bismarck
Schumacher, Wm. A. Hetinger
Schumacher, N. W. (Rtd.) Hettinger
Schwinghamer, E. J. New Rockford
Sedlak, O. A. Fargo
Seiffert, G. C. Minot
Sihler, W. F. (Hon.) Devils Lake
Silverman, Louis Grand Forks
Smith, C. C. Mandan
Smith, Clinton Devils Lake
Sorenson, A. R. Minot
Sorenson, Rodger Minot
Sorkness, Joseph Jamestown
Spanjers, A. J. Dickinson
Spear, A. E. Dickinson
Spielman, G. H. Mandan
Spomer, J. P. Minot
St. Clair, R. T. Northwood
Stafne, W. A. Fargo
Sterns, Donald Grand Forks
Stickelberger, J. S. (Rtd.) Oberon
Stratte, J. J. Grand Forks
Strom, A. D. Langdon
Swanson, J. C. Fargo
Smith, Oscar M. Killdeer
Tainter, Rolfe Fargo
Thompson, Andrew M. Wahpeton
Thompson, Arnold Bismarck
Thorgrimson, G. G. Grand Forks
Timm, J. F. (Hon.) Portland, Ore.
Tompkins, C. R. Grafton
Toomey, G. W. Devils Lake
Tronnes, Nels (Rtd.) Fargo
Turner, R. C. Grand Forks
Urenn, B. M. Fargo
Uthus, O. S. Minot
Vance, R. W. Grand Forks
Van Houten, J. Valley City
Van Houten, R. W. Oakes
Van Lier, Peter C. Rugby
Veitch, Abner Lisbon
Vigeland, G. N. Maddock
Vinje, E. G. Hazen
Vinje, Ralph Beulah
Vinje, Syver Hillsboro
Vogl, Charles Miles City, Mont.
Voglewede, W. C. Carrington
Vonnegut, F. F. Linton
Waldren, G. R. Cavalier
Waldren, H. M., Jr. Drayton
Waldschmidt, R. H. Bismarck
Wall, W. W. Minot
Wallbank, W. L. San Haven
Watson, E. M. (Rtd.) Fargo
Weed, F. E. Park River
Weible, R. D. Fargo
Westley, K. F. Cooperstown
Weyrens, P. J. Hebron
Wheeler, H. A. Mandan
Wheelon, F. E. Minot
Wicks, F. L. Valley City
Williamson, G. M. (Hon.) Grand Forks
Witherstine, W. H. Grand Forks
Wolfe, F. E. Oakes
Wood, W. W. Jamestown
Woodhull, R. B. Minot
Woodward, F. O. Jamestown
Woodward, R. S. Jamestown
Woutat, P. H. Grand Forks
Wright, W. A. Williston
Wasemiller, E. R. Wahpeton
Youngs, N. A. Grand Forks

THIRD ANNUAL MEETING
WOMAN'S AUXILIARY TO THE NORTH DAKOTA STATE MEDICAL ASSOCIATION
Minot, North Dakota, May 15, 16, 17, 1949

The Third Annual meeting of the Woman's Auxiliary to the North Dakota State Medical Association, held in Minot, North Dakota, was formally opened by Mrs. W. F. Baillie, State President, at 10:00 A.M., May 16, 1949. The place of meeting was the Sky Room of the Clarence Parker Hotel in Minot.

Mrs. Baillie presented her Parliamentarian, Mrs. F. L. Wicks of Valley City.

The "pledge" was given by Mrs. R. W. Rodgers of Dickinson and repeated in unison by the members present.

Dr. W. A. Liebeler of Grand Forks, President of the North Dakota State Medical Association, was then presented by Mrs. Baillie. Dr. Liebeler gave a short talk, stating that the State Association was fortunate in having an Auxiliary to aid them in the important work they are trying to do. He urged members of the Auxiliary to fight for the "American Way," as opposed to socialization and conveyed the best wishes of the State Medical Association for a successful convention for the Auxiliary.

The Address of Welcome was given by Mrs. M. T. Lampert of Minot on behalf of the Woman's Auxiliary of the Northwest District.

The Response was given by Mrs. G. G. Thorgrimson of Grand Forks, who thanked Minot for being host at the convention and also the ladies of the Auxiliary for attending.

Mrs. Baillie then presented the President-elect, Mrs. H. M. Berg of Bismarck. Mrs. Berg stated that she hoped all members would work hard for the good of the Auxiliary and that our organization would continue to grow.

Mrs. John Devine, Jr., Chairman of the Convention Committee, then was introduced. She in turn presented the members of her committees.

Mrs. Baillie then introduced the guest of the convention, Mrs. Harold F. Wahlquist, President, Woman's Auxiliary, Minnesota State Medical Association.

A Memorial for Mrs. G. M. Williamson of Grand Forks, who died during the past year, was read by Mrs. Thorgrimson of Grand Forks.

The Roll was then called and the following were present:

Officers: Mrs. W. F. Baillie, President; Mrs. H. M. Berg, President-elect; Mrs. E. T. Keller, 1st Vice-President; Mrs. John L. Devine, Jr., 2nd Vice-President; Mrs. V. G. Borland, Treasurer.

State Chairmen: Mrs. N. O. Ramstad, Historian; Mrs. H. M. Berg, Organization; Mrs. W. B. Pierce, Legislation; Mrs. H. Paul Johnson, Program; Mrs. C. R. Dukart, Hygeia; Mrs. J. C. Fawcett, Revisions; Mrs. F. L. Wicks, Parliamentarian; Mrs. P. G. Arzt, Nominating Committee.

Councillors: Mrs. V. D. Fergusson, Eighth District; Mrs. R. W. Rodgers, Tenth District; Mrs. W. H. Gilsdorf, Fifth District.

Presidents: Mrs. G. G. Thorgrimson, Grand Forks; Mrs. A. K. Johnson, Kotana; Mrs. F. L. Wicks, Sheyenne Valley; Mrs. O. DeMoully, Sixth District; Mrs. F. W. Fergusson, Southern District.

Cass County	3	representatives
Devils Lake	4	"
Grand Forks	4	"
Kotana	1	"
Northwest	11	"
Sheyenne Valley	2	"
Sixth District	4	"
Southern	2	"
Southwestern	3	"
Stutsman	2	"
Traill-Steele	1	"
Tri-County	1	"

Mrs. Baillie, President, then gave her president's report to the Convention. She told of the accomplishments of the Auxiliary during the past year and stressed the issue of our obligations to the community as doctors' wives. A copy of this report will be sent to the component Auxiliaries.

Mrs. Baillie then requested Mrs. H. M. Berg, President-elect, to tell the Convention a few highlights of her recent trip to Europe. Mrs. Berg spoke briefly on her observations in connection with socialized medicine in Europe and the type of medical care these peoples are now receiving.

The following reports were then given by the officers, state chairmen, councillors and Auxiliary presidents:

Mrs. H. M. Berg, President-elect
Mrs. V. G. Borland, Treasurer
Mrs. N. O. Ramstad, Historian
Mrs. F. O. Woodward, Bulletin
Mrs. W. B. Pierce, Legislative Chairman
Mrs. H. P. Johnson, Program
Mrs. C. R. Dukart, Hygeia
Mrs. V. D. Fergusson, Councillor
Mrs. R. W. Rodgers, Councillor
Mrs. W. H. Gilsdorf, Councillor
Mrs. V. G. Borland, Cass County Auxiliary
Mrs. D. W. Fawcett, Devils Lake
Mrs. G. G. Thorgrimson, Grand Forks
Mrs. A. K. Johnson, Kotana
Mrs. F. L. Wicks, Sheyenne Valley
Mrs. O. DeMoully, Sixth District Auxiliary
Mrs. F. W. Fergusson, Southern District
Mrs. A. J. Gumper, Southwestern District
Mrs. P. G. Arzt, Stutsman District
Mrs. T. M. Cable, Traill-Steele

The complete reports will be combined into a handbook, which will be sent to the various Auxiliaries.

President's Report

Two years ago you named me President-elect of the Woman's Auxiliary to the North Dakota State Medical Association. This was an honor I felt very humble in accepting. I am grateful for your faith in me. I hope I have not failed you. Now, after serving as your President for the past twelve months, I am presenting my annual report for your consideration and approval.

Being such a new Auxiliary we were not able to accomplish as much as could be desired. Many of our groups were not ready to carry a very heavy program, as it seemed important to stress the social side and get acquainted. However, as you hear their reports you will realize they have all been busy and have accomplished much more than I ever thought would be possible. I am very proud of their work. Owing to the severe winter, it was impossible for many of our district auxiliaries to meet often.

Our first year was given over almost entirely to organization and we are very proud to report every medical district with an auxiliary, all coming in as charter members.

As your president it was my privilege to attend the National Convention of the Woman's Auxiliary to the American Medical Association, held in Chicago, June, 1948. I also attended the Conference of Presidents and Presidents-elect held in Chicago November 4th and 5th. These meetings were a great inspiration to me and I came away realizing more fully our responsibility as doctors' wives to carry far and wide the message of good medicine, and with a determination to put forth every effort toward fulfilling my duties in the office entrusted to me.

The Fall Board meeting of our State Auxiliary was held in Fargo, September 30, 1948, with a very good attendance of officers and state chairmen.

I attended the Red River Valley Health Day held in Crookston, Minnesota, in October, 1948. This was sponsored by the Woman's Auxiliary to the Red River Valley Medical Society.

Perhaps the most rewarding of all your president's activities was attending the regular meeting of several of our district

auxiliaries. Words cannot express the personal satisfaction it gave me to see these groups in action and to note the friendship and cooperation which existed among their members. My one regret is that I could not visit every Auxiliary.

Feeling that it was vital for our membership to be informed as to the problems facing the medical profession, I mailed out packets of literature to each Auxiliary. I furnished material for two club papers and placed material in our Masonic library, to be used as source material for programs throughout the state.

Our membership has made a slight increase over last year. Subscriptions to the Bulletin and Hygeia have not increased as much as we could wish. However, I definitely feel we have gone forward in enthusiasm and interest.

I am firmly convinced that the work of the Woman's Auxiliary is very important. The role of the doctor's wife may not appear to have materially changed but the scope of her activities and responsibilities has broadened, even as our world has become smaller. Health has no limits, disease knows no boundaries. The work of medicine is a world problem. We must create a feeling of partnership between the medical profession and the public, with one end in view, the continual improvement of health and medical care. People recognize that medicine is the life work of the physician. They must be reassured that the medical world is interested in the welfare of every man, woman and child. To bring this assurance, to further health education is the work of the Auxiliary.

The program of the Auxiliary is definite, concrete and far-reaching. It is all-inclusive yet it is basically simple, because it touches at the very foundation of our lives. It is a program that challenges our best efforts and affords everyone an opportunity to participate in some measure, no matter how slight may be the contribution.

While we carry out our program in our community, our county, state and nation, we cannot but be aware of the world levels. We here in America have the opportunity to set up a pattern of health that will carry through the world. We of the Auxiliary have it in our power to play a leading and decisive part in the fulfillment of this aim. As a doctor's wife, each member of the Auxiliary is a representative of the medical profession.

Our most important function has been and will be to help carry out the aims of the American Medical Association which are to help provide the highest quality of medical and health care for the people of our nation, but it is equally important that we do our utmost to help educate the public to the dangers inherent in the proposals for compulsory health insurance and its many ramifications. We must do more than "fight fire with fire." We must fight false theories with facts. And we must be alert to recognize false and vicious propaganda when it shows itself, in order that we may act without delay to refute it.

The first need for the Auxiliary is to be basically informed on the issues at stake. We should obtain factual material. Only if we present the factual side of the problem of medical care to the people can we expect to preserve the principles of voluntary medical care. Our national president, Mrs. Kice, has recommended that every member read and study the impartial report of the Brookings Institute, "The Issue of Compulsory Health Insurance." The findings of this respected and unbiased organization should be placed before every local group interested in health, so that the general public may have a better understanding of all phases of this problem, and may be warned against the dangers of government-controlled medical care.

Armed with the facts, Mrs. Doctor can actually be the diplomatic expert on Socialized Medicine in her own home. Many doctors are too busy healing the sick and studying new medical-scientific trends to study the social and political aspects of their profession. William Doscher, Assistant Director of Public Relations Department of the American Medical Association says, "Intelligent women have a special ability and agility to sense the subtle attacks on the freedom of the profession made by power-seeking bureaucrats. Women can arm their own husbands with the facts and encourage him to express himself to others in his community about this alarming problem. In your own quiet, influential way you can simply present the facts so that those that know you will at least not be ignorant of the dangers inherent in government medicine."

It is natural for doctors' wives, who have many interests in common, to enjoy each other's company socially. That is fine. But as public relations ambassadors, our Auxiliaries should not solely concentrate on social activities. Nothing could create a poorer impression on state and local newspapers and on the community. Each time a county publicity chairman writes a story for the newspapers, she can stress the social service, health and welfare activities of your meetings, rather than the purely social ends. Otherwise, the general public begins to think of doctors' families as socialites, rather than as thoughtful persons who have a sincere interest in the general welfare of the public.

Before closing this report, I wish to thank Mr. Engebretson and the North Dakota State Medical Association for their splendid cooperation and assistance during the year. Without their assistance our Auxiliary would have had a much more difficult time in getting started. Mr. Engebretson was always very gracious when we called upon him for help and you may be assured it was necessary to call upon him many times during the year.

I wish to express my appreciation to the women of Minot for their wonderful response in planning for this convention. To each one individually I say *thank you.*

To the officers, state chairmen, councillors, district Auxiliary presidents and to the members of the Auxiliary individually goes my deepest appreciation. Because of you my life has been made richer, fuller and vastly rounder. I shall forever cherish the friendships formed this year.

Mrs. W. F. Baillie, President

Historian's Report

Although our history at this time is necessarily very brief, it is packed with action.

May 26, 1947, is an important date in our annals. On that day, after a delightful luncheon at El Zagal Clubhouse in Fargo, with the help of Mrs. Leo J. Schaefer of Salina, Kansas, who was at that time second Vice President of the National Woman's Auxiliary to the American Medical Association, our Woman's Auxiliary to the North Dakota State Medical Association was organized. During that momentous Monday and the following busy Tuesday, officers and councillors were appointed and elected, so that from then on, we were ready to assist our husbands and our state in a more efficient manner. Between the time of that May meeting in Fargo and our second annual meeting in Jamestown on May 22, 1948, all ten major districts in our state were organized.

On October 29, 1947, in Jamestown, there was held a very important Executive Board meeting, which speeded up the work by completing plans for the state-wide organization. The efficiency and rapidity with which these plans were carried out show how well chosen were our first officers and councillors.

At the 1948 Convention in Jamestown it was decided to include as charter members, all groups who had paid their dues by June 30, 1948.

According to our handbook our history should include lists of names and achievements of all officers, committee chairmen, and councillors. Such a list is appended and included in the Historian's file.

As all of you have read copies of the reports of our two conventions, I shall not even recapitulate here, except to say that in both Fargo and Jamestown the business of the orgnization was so efficiently conducted that we scarcely realized we were working, and the doctor's wives of both cities instilled such a cordial hospitality into all activities that we felt as though we had been attending great social occasions. Full reports of these conventions are in the file. The Board meetings were composed of small groups, but much work was accomplished in a short time.

Twenty-seven officers, committee chairmen and councillors attended a Board meeting in Fargo on September 30, 1948. Names and special measures recommended at this time are in this file, but I should like to mention that Mrs. Borland reported that even at that early date we had 204 paid memberships and a balance on hand of $127.00.

Our Handbook also directs that this report should include a list of the objectives of our organization. Thus far, perhaps the most important of these objections has been "one hundred per cent registration."

Next we should consider ourselves a state-wide Public Relations Committee regarding the following points:

1. The benefit of Voluntary Group Health Insurance.

2. The real meaning of compulsory Government Health Insurance.
3. Let the public know that doctors have a better plan.
4. Make the public realize that our husbands are greatly overworked.
5. Assist with public health work in all possible ways.
6. Because uninformed prejudice does no good, we should keep ourselves informed, so that we may speak intelligently and coherently on matters pertaining to public health.
7. Refrain from mumbling disapproval.
8. Undertake no project without the approval of our advisors.

Although the names of all officers, councillors, committee chairmen and guest speakers are mentioned in the Historian's file, I cannot close this report without remarking on our great good fortune at the very beginning of our history in having such excellent officers. Mrs. Hanna, Mrs. Weible, Mrs. Arzt, Mrs. Baillie and Mrs. Berg—all had a gift for organizing, but Mrs. Arzt, Mrs. Baillie and Mrs. Berg put in much hard work traveling when it was next to impossible and spending long hours in correspondence. Mrs. O. M. Smith of Killdeer and Mrs. R. G. Rodgers of Fargo have also spent many hours at Auxiliary correspondence and their excellence as secretaries did much to accelerate our progress. Mrs. V. G. Borland of Fargo contributed greatly to our organization by her clear thinking and comprehension of financial matters. As we shall hear reports of the work of all of our officers, chairmen and councillors and as they are all contained in our files, I will desist from further repetition.

In one of his advisory talks to us, Dr. Arzt said "So many people are talking of so many things and so many know so little. Hence, I shall soon pursue only silence."

If this file may serve as a beginning for our next Historian, I shall be very glad to give it to her and only hope its contents may prove to be of value in the progress of our Woman's Auxiliary to the North Dakota State Medical Association.

EDNA WINCHESTER RAMSTAD, Historian

Program Chairman's Report

My report to Mrs. Pohlmann, National Program Chairman, dealt not so much on the individual Auxiliary programs but on the achievements made in organization in North Dakota.

With two years of good organization efforts past, the next year should take advantage of the wealth of material for programs offered by the National Auxiliary.

I should like to suggest that as soon as the program chairmen for the individual groups are appointed that they send their names to the State Chairman.

The National Auxiliary send splendid material to the state and if we are to work as a unit in the state organization, we should follow definite plans as given to the state by the National.

Since many objectives and plans are suggested, certainly one can be found suitable to the wishes of the individual groups. And there is much satisfaction at the end of the year in the reports to find that all of the efforts placed together show how much can be accomplished by the State Auxiliary.

One more suggestion—read the Bulletin of the Woman's Auxiliary to the American Medical Association. You will understand its objectives and realize how much of a part your group can take in this large undertaking.

Mrs. H. P. JOHNSON, Program Committee

Auxiliary President's Report—Devils Lake District

There were three meetings of the Auxiliary during the past year, one in November, 1948, one in April, 1949, and one in May, 1949.

There are thirteen members in the Auxiliary, all active and interested in the work.

The Auxiliary during the past year worked on two projects to benefit the District Medical Society. The first was to get non-auxiliary friends to write to the state legislators and express their opposition to H.B. 122 regarding licensing displaced doctors in the state. The second project involved obtaining moving pictures designed to stir up interest in nursing and taking these movies with nurses from the local hospitals to explain the advantages of a nursing career, to the high school assemblies throughout the district for showing. The pictures were shown a total of eleven times. Considerable and gratifying interest was shown by the high school students after each of these showings.

There are still several doctors' wives in the district who do not belong to the Auxiliary. We are hoping these too will be active members by next year.

Mrs. D. W. FAWCETT, President

Auxiliary President's Report—Grand Forks District

On May 6, 1948, the ladies of the Grand Forks District met and organized, with 22 members for the year. The present membership is 32 out of an eligible number of 60. One member died in 1949.

I attended the Executive Board meeting in Fargo, September 3, 1948. In October I met with the officers of our district board and committee members to outline plans for the coming year. It was decided to hold dinner meetings the same evening as the doctors held their meetings. A short business meeting followed the dinner, after which we had a music program or played bridge at the home of one of the members. We held four meetings with an average attendance of twenty members. A constitution and by-laws were drawn up and adopted by the group.

At our April meeting we elected the officers for the coming year and they will be installed in May.

Mrs. G. G. THORGRIMSON, President

Auxiliary President's Report—Kotana District

The Auxiliary to the Kotana District Medical Society has seven members this year, one less than last year, since Mrs. Skjelset has moved away. The annual meeting was held February 9, 1949, with a luncheon down town. All the members were present.

Mrs. Willard Wright reported that she had given a talk at the P.E.O. meeting on Bill 122. Mrs. Alan Johnson reported that she had arranged that Attorney Everett Palmer write a letter to our state representative on the same bill, stating the views of this Auxiliary.

All members paid the arrears dues of $2.00 and the dues for the coming year.

Election of officers was held.

Mrs. A. K. JOHNSON, President

Auxiliary President's Report Sheyenne Valley District

The Sheyenne Valley Medical Auxiliary has ten paid memberships, as against eleven of a year ago. This one ex-member is an out-of-town eligible and we have been unable to ascertain why she has not joined but believe it to be her absence from the state and also her inability last year to attend meetings on account of bad roads. Therefore we think our ten of eleven eligibles to be very creditable. We also think our average attendance of eight is pretty good.

We were late getting started this year but with the April meeting, we will have had four very good ones.

The President is very gatified with the manner in which the members have participated in discussions and bringing their own material, other than that which was sent by the state president, Mrs. Baillie, and which was passed out to be read and reported on by the various members.

The highlight of our year was when our state president, Mrs. Baillie, was invited to visit us and on her acceptance we promptly planned a dinner, which was held at the home of Mrs. C. J. Meredith. Following the dinner, helpful suggestions by Mrs. Baillie and questions by members made this a memorable occasion. We all felt a little social life can be quite a stimulus to members and can be mixed with the serious side of meetings.

Mrs. Paul Cook has conducted a survey of all doctors' and dentists' offices and the libraries in town, to find out just how widely Hygeia is being used. If we find where it could be useful we may place it there. Also, if our finances permit, we hope to purchase copies of the Brookings Institute Report and place one in our State Teachers College library and one in our public library.

We have delayed doing anything about the National Bulletin, as we were resting on the assurance that "something different" was to take its place in the National field.

We have amended our local constitution in two places: one, to make it flexible enough to take care of national and state dues; the other, to have new officers elected before instead of after the state meeting.

At the last meeting on April 20th our program chairman, Mrs. Christianson, hopes to have the public school nurse talk to us and thereby deviate from our discussions which this year have been mostly concerned with the trend toward compulsory health insurance.

A number of our members helped to contact legislators and thereby lent our bit toward killing the bill in committee on displaced doctors.

Mrs. F. L. Wicks, President

Auxiliary President's Report—Sixth District

There are fifty-two doctors' wives in the county who are eligible for membership in our Auxiliary. At the beginning of our first year we had twenty-six members but during the year one member died and one moved out of the district. At present we have thirty-two paid-up memberships, a gain of eight over last year.

Auxiliary meetings are held four times a year with an average attendance of twenty. At our first meeting held in October, State Health Officer spoke on Mental Hygiene. At our second meeting held in December we had an outside speaker, who gave an interesting talk on Crippled Children, showing movies covering methods of treatment, recreation and education. Both were interesting and educational. Due to impassable roads the February meeting was cancelled.

I believe all members were interested and cooperated in every way possible to help defeat House Bill 122.

Dinner meetings held at the same time as the Medical Society of the Sixth District have been our only social activity and have helped the members to become better acquainted. Notices of meetings are reported to the local press.

Due to members receiving postcard notices for renewal of the National Bulletin, I was unable to determine the exact number of subscriptions for this year. We had 19 subscriptions last year.

The general attitude of our Medical Society has been cooperation.

Our third dinner meeting was held April 26, 1949. Mrs. Baillie, our State President, was our guest speaker and spoke to us on Compulsory Health Insurance. Mrs. W. B. Pierce of Bismarck gave a reading by Dr. Elmer L. Henderson, Chairman of the Board of Trustees, American Medical Association. The subject was "A Doctor's Diagnosis of President Truman's Compulsory Health Insurance Program." We also had the election of officers.

Mrs. Oliver M. DeMoully, President

Auxiliary President's Report—Southwestern District

1. We have sixteen doctors' wives that are eligible for membership.

2. One year ago we had ten active members. At present we have eleven active members.

3. Our meetings are held four times a year, with an average attendance of ten members.

Program: Our meetings consist of work regarding the placement of Hygeia in schools and offices, discussions on socialized medicine and current topics regarding the National Medical situation. We have had one outside speaker discussing the legislation on the medical bills. Also a discussion on the Blue Shield plan, which our Southwestern Medical Society sanctioned.

Hygeia: We have credit for ten subscriptions to Hygeia.

All members are interested in receiving the state news letters.

We have ten Bulletin subscribers.

Our social activities have consisted of dinner and our meetings.

Mrs. C. R. Dukart and Mrs. R. W. Rodgers attended the State Convention and the State Auxiliary meeting held in Fargo.

Our delegates to the State Convention will be Mrs. C. R. Dukart and Mrs. R. W. Rodgers of Dickinson.

Mrs. A. J. Gumper, President

Auxiliary President's Report—Stutsman County

The Auxiliary to the Stutsman County Medical Society has had 16 members for the past year. A year ago we also had 16 members. During that time we have gained 2 members and lost 2 members. The average attendance at our meetings has been 12 members.

Our first meeting was a business meeting. Dues were discussed, committee chairmen were named, and Bulletin and Hygeia subscriptions were taken. It was voted that we give one Hygeia subscription to a rural school and to supply the local President and Secretary-Treasurer with the year's subscription to the Bulletin.

At Christmas time we prepared and delivered two large boxes of food, clothing and miscellaneous gifts to needy families. One was to a local Jamestown family and one to a rural family.

At our next meeting we had a dinner and had Dr. Richard Nierling as our guest speaker. Dr. Nierling gave us a very interesting and educational talk on what progress had been made toward a prepaid medical plan for the state of North Dakota.

Our last meeting was for election of officers for the coming year and electing delegates for the State Convention.

We have a possibility of three new members for the coming year.

We feel that the past year has been a successful one and have hopes for improvement in the future.

Mrs. J. N. Elsworth, President

Auxiliary President's Report—Traill-Steele District

Our membership remained the same but we will be losing one member soon because they are moving to another location. We have eight paid-up members, which is 100 per cent. Of our members there usually are about five at a meeting.

We have had only two meetings so far this year and they were spent having dinner together and then a social hour at one of the homes. We have not had any planned program since the group decided they wanted to be purely social and informal.

We all subscribed to the Bulletin last year and I believe most of the members renewed their subscriptions.

Our one project this year was to give three gift subscriptions to Hygeia to our local hospitals.

Mrs. T. M. Cable, President

A motion was made by Mrs. Borland, seconded by Mrs. Ramstad that all reports be accepted as read and that the said reports be placed on file.

Mrs. Pierce then suggested that each Auxiliary make a determined effort to have various groups and clubs in their communities go on record as being opposed to socialized medicine. This should be done in the form of a resolution adopted by the organization as a whole, copies of which should be sent to the President of the United States, congressmen and state legislators.

Mrs. Borland presented the following budget for the Auxiliary for the fiscal year 1949-1950 and moved that the Convention adopt the budget:

INCOME

Dues from 220 members	$440.00
From State Medical Association	200.00
Total Income	$640.00

PROPOSED EXPENDITURES

President:	
(1) Discretionary fund (visiting districts and entertaining guests, etc.)	$ 50.00
(2) Miscellaneous fund (telegrams, telephone and stamps)	25.00
(3) Toward expenses to Chicago Board Meeting	25.00
(4) Railroad fare plus $50.00 to the National Convention	75.00
President-elect (1) Chicago Board Meeting	25.00
Treasurer	8.00
Standing Committees (10 to have $5.00 each)	50.00
Convention Fund	200.00
Miscellaneous Fund	82.00
	$640.00

After a discussion Mrs. Borland's motion was seconded by Mrs. Pierce and upon vote the budget was declared adopted unanimously.

Mrs. Keller then gave the report of the Auditing Committee, stating that the Treasurer's books balanced and were in proper order, with all entries made. It was moved by Mrs. Berg and seconded by Mrs. Pierce that the report be accepted and upon being put to a vote the motion carried.

Mrs. Keller then made a motion that the sum of $100.00 be taken from the Treasury of the Women's Auxiliary to the State Medical Association and that the sum of $50.00 be given

to Mrs. Arzt, past president of the Auxiliary, and a like sum of $50.00 be given to Mrs. Baillie, president, to reimburse them for expenses incurred during their tenures as presidents. The motion was seconded by Mrs. Devine, Jr., and upon being put to a vote carried unanimously and the Treasurer was instructed to make the disbursements as stated in the motion.

Mrs. Keller made a motion that all bills incurred by the officers and chairmen of the state committees during the fiscal year and all bills in connection with the state convention be presented to the Treasurer and upon presentation said bills be paid out of the funds in the treasury of the Woman's Auxiliary. Mrs. Thorgrimson seconded the motion and upon being put to a vote it carried unanimously.

The meeting was then adjourned to reconvene at 2:00 o'clock P.M. in the Sky Room of the Clarence Parker Hotel.

The Convention reconvened at 2:00 o'clock P.M., May 16, 1949. The meeting was called to order by Mrs. W. F. Baillie, presiding officer.

Mrs. Baillie read a telegram from Mrs. Leo J. Schaeffer, Director of the National Auxiliary, who sent the convention her best wishes for a successful meeting.

Mrs. Baillie then presented Mr. Engebretson, Executive Secretary of the State Medical Association. Mr. Engebretson spoke on the importance and necessity of getting literature on socialized medicine to the public and also the benefits of "good public relations." He suggested that the Auxiliary have "Health Program Days" as one of their projects and pointed out the benefits of having all agencies in a community who are interested in health matters cooperating to let the public know what is being done for them in their locale. He also informed the Convention that the Council had voted the sum of $200.00 yearly for the Auxiliary, to help defray its expenses. Mr. Engebretson also impressed upon the Auxiliary the great effect the efforts of the Auxiliary have had and urged the members to make their wishes felt, as they can have a tremendous influence on public opinion.

Mrs. Arzt made a motion that the reading of the minutes of the Second Annual Convention held in Jamestown, May 24 and 25, 1948, be suspended. The motion was seconded by Mrs. Berg and upon being put to a vote carried.

Mrs. Baillie then called for the report of the Registration Committee, who reported a registration of 52 members.

Mrs. Boyum, Harvey, Councillor for the Ninth District, and Mrs. McCannel, Councillor for the Fourth District, submitted their resignations as Councillors. It was moved by Mrs. R. W. Rodgers and seconded by Mrs. Devine, Jr., that these resignations be accepted and that the Nominating Committee be instructed to nominate two other people for the vacancies thus created. Upon vote the motion carried.

A motion was made by Mrs. Ramstad and seconded by Mrs. Thorgrimson. that all Auxiliaries be accepted as Charter Members of the Woman's Auxiliary to the State Medical Association. Upon being put to a vote, the motion carried.

The "Fiscal Year" of this Association was explained fully to the ladies of the Auxiliary. The "Fiscal Year" runs from convention to convention. New officers of component auxiliaries should be elected at the last meeting preceding the convention and should take office the following fall, to serve until the next convention.

Mrs. Baillie explained that the cost of a Handbook would have been $45.00 and it was decided by the Executive Board that this was too high a price for the benefits that would occur.

Mrs. P. G. Arzt, Chairman of the Nominating Committee, then submitted the following report:

For President—Mrs. H. M. Berg, Bismarck.

President-elect—Mrs. E. T. Keller, Rugby.
1st Vice President—Mrs. V. D. Fergusson, Edgeley.
2nd Vice Pres.—Mrs. G. G. Thorgrimson, Grand Forks.
Secretary—Mrs. J. Jansonius, Jamestown.
Treasurer—Mrs. R. W. Rodgers, Dickinson.

For Councillors—

2nd District—Mrs. G. W. Toomey, Devils Lake.
7th District—Mrs. Cuthbertson, Jamestown.
10th District—Mrs. C. R. Dukart, Dickinson.
9th District—Mrs. R. F. Gilliland, Carrington.

Mrs. Baillie then asked for nominations from the floor for these officers. As there was none, she then requested a motion nominating the slate of officers. It was moved, seconded and carried, that the Secretary be instructed to cast a unanimous ballot for the entire slate of officers. All voted "Aye".

The following resolution was then offered by Mrs. Pierce, who moved its adoption:

Whereas: the United States under its voluntary system of medical care has made greater progress in the application of medical and sanitary science than any other country, and,

Whereas: the advances in health in the United States in the past four decades do not suggest basic difficulties in the American system of medical care, and,

Whereas: more than one out of every three Americans is now covered by voluntary hospital insurance, and one out of every four is covered by voluntary surgical or medical and surgical insurance, and coverage is continuing to rapidly increase, and

Whereas: compulsory health insurance would necessitate a high degree of governmental regulation and control over personnel and the agencies engaged in providing medical care, and

Whereas: the enactment of compulsory health insurance would destroy the personal relationship between the physician and patient, undermine the quality of medical care and produce deterioration in the health of the people, and,

Whereas: workers in European countries that have adopted compulsory health insurance have lost from 50 per cent to 100 per cent more days per year because of illness than American workers, and,

Whereas: compulsory health insurance would create a tax burden of unbearable proportions on an already overstrained economy, and,

Whereas: compulsion is a totalitarian concept and contrary to American principles,

Now, therefore, be it resolved, by the Woman's Auxiliary to the North Dakota State Medical Association in convention assembled in Minot, North Dakota, May 15, 16, 17, 1949, that we continue our unalterable opposition to the adoption of any program of compulsory health insurance or government controlled medicine, for the American people.

The motion was seconded by Mrs. Ramstad and upon being put to a vote carried unanimously and the above resolution was declared adopted by this Convention.

A Resolution to Amend Article IV (Membership) Section 2 and 3, of the Constitution of the Woman's Auxiliary to the State Medical Association was then presented. After a long discussion the resolution was referred back to the Resolutions Committee, which was instructed to turn it over to the state chairman of the Revisions Committee for further study and clarification.

The matter of a quarterly "News Letter" was then discussed. The following motion was made by Mrs. Keller and seconded by Mrs. Arzt:

"That the Woman's Auxiliary to the State Medical Association sponsor a 'News Letter' for a period of one year; that a State Publicity Chairman be appointed by the State President; and that the duties of said State Publicity Chairman be to gather and coordinate news and information sent in by local Auxiliaries and cooperate with the Executive Secretary of the State Medical Association in publishing a quarterly 'News Letter'."

Upon being put to a vote the motion carried.

It was suggested that each Auxiliary President appoint a publicity chairman, whose duty it will be to see that items for this bulletin are sent to the State Publicity Chairman. This material can consist of news about any project undertaken by the component Auxiliary, personal items or local news which would be of interest to all members.

The recommendation of the Executive Board that each Auxiliary purchase two copies of the Brookings Institute Report and place them in the public libraries and schools was confirmed by the Convention.

It was moved by Mrs. R. W. Rodgers and seconded by Mrs. Keller that the Woman's Auxiliary to the State Medical Asso-

ciation have a "President's Pin"; that all past presidents be eligible for this pin; and that a committee be appointed to decide upon such a pin. Upon being put to a vote, the motion carried.

The Convention then adjourned, to reconvene Tuesday, May 17, at 11:00 o'clock A.M. at the Country Club at Minot.

* * * *

The Woman's Auxiliary to the State Medical Association reconvened at 11:00 o'clock A.M. at the Country Club at Minot, on Tuesday, May 17, 1949.

The meeting was called to order by Mrs. Baillie, President.

Mrs. Kernwein made a motion that the Revisions Committee make a thorough study of the Constitution and By-Laws of the Auxiliary and present their recommendations for changes and amendments at the next board meeting to be held in the fall. The motion was seconded by Mrs. Keller and upon being put to a vote, carried.

It was moved by Mrs. Keller that when the minutes are completed that a Reading Committee be appointed by the President, Mrs. Baillie, whose duty it would be to check the minutes for any omissions, corrections or substitutions and also to write a summary of these minutes, to be read at the next convention. The motion was seconded by Mrs. Ramstad and upon vote carried.

Mrs. Baillie then appointed the following Reading Committee: Mrs. C. R. Dukart, Dickinson; Mrs. R. W. Rodgers, Dickinson.

It was moved by Mrs. Rodgers and seconded by Mrs. McCannel that a memorial be written for those members of the Auxiliary who had died during the preceding year and that said memorial be placed in the Historian's files. Upon vote the motion carried.

Mrs. Thorgrimson nominated Mrs. Devine of Minot as delegate to the National Convention, to be held in Atlantic City, New Jersey, June 6-10, 1949. The motion was seconded by Mrs. Keller and upon vote, Mrs. Devine was declared elected.

Mrs. Keller then nominated Mrs. G. W. Toomey of Devils Lake as second delegate to the said convention. The nomination was seconded by Mrs. McCannel and upon vote Mrs. Toomey was declared elected.

Mrs. Baillie then called for the report of the Courtesy Committee and Mrs. C. R. Dukart gave the following report:

"On behalf of the entire Auxiliary to the North Dakota State Medical Association, may I extend our sincere thanks and appreciation to the Minot Auxiliary for the courtesies extended us during the Convention and for our very fine meeting, so well planned and carried out.

"From former experiences you all realize the plans, preparations, work and time which is so necessary to make these conventions a success and it is very visible that none of these were spared by our Minot hosts and hostesses in making our stay so enjoyable and yet beneficial.

"May I mention a few details which I have overheard: very favorable comments from various members; our welcoming address from Dr. Liebeler; and especially the excellent and inspiring talks of Dr. Wright and Mrs. Wahlquist, as well as the pledge of assistance from Mr. Engebretson, which he has so willingly given to the Auxiliary.

"The mixer at the Country Club Sunday evening proved very successful and it gave everyone an opportunity for meeting and renewing acquaintances.

"The food was excellent, particularly our lovely banquet, and the floral centerpieces and corsages added not only a touch of beauty but also of thoughtfulness.

"So to Mrs. Devine, Jr., who so ably acted as General Chairman, and to each member of her committees—thank you, thank you very much."

It was moved by Mrs. Keller and seconded by Mrs. Fergusson that the report of the Courtesy Committee be accepted and that a copy be made and sent to the President of the Northwest District Auxiliary. Upon vote the motion carried unanimously.

Mrs. Erenfeld, Jr., then made the following motion:

"I move that the State Legislative Chairman, with consultation of the Advisory Committee, compose a letter to be used as a sample for County Presidents to distribute to all women's groups in her county, asking them to oppose compulsory health insurance. A statement of facts which may be used in this resolution should accompany the letter."

Mrs. Halvorson seconded the motion and upon being put to a vote the motion carried unanimously.

The following motion was then offered by Mrs. Fergusson:

"I move that each member, as far as possible, contact fifteen people in their community, asking them to send a personal letter to the President of the United States and their congressmen and senators, opposing compulsory health insurance, making this letter brief and to the point."

The motion was seconded by Mrs. Sorenson and upon being put to a vote, carried.

The President of the Northwest Auxiliary then asked for the floor and requested that the members of the Auxiliary give a rising vote of thanks to Mrs. Baillie for the very successful job she has done as President of the State Auxiliary.

Mrs. Baillie then requested that a rising vote of thanks be given Mrs. Wahlquist, President of the Minnesota Auxiliary, who has given so freely of her time and energies in attending this Convention.

Mrs. Erenfeld, Sr., then spoke briefly about the work of the patients at the State Sanitarium at San Haven and suggested that the Auxiliary members remember that the handiwork of these patients is for sale.

Mrs. Baillie then turned the meeting over to Mrs. Wahlquist, who requested that all the new officers and Mrs. Baillie stand up. She then congratulated them on their new duties and formally installed them in their new offices.

Mrs. Baillie then thanked the Auxiliary for their cooperation during her tenure as President and turned the meeting over to the new President, Mrs. H. M. Berg, of Bismarck.

Mrs. Berg stated that a regular Post-Convention Board meeting would not be held. She set the third week in September as the tentative date for the fall Board meeting but stated that she would advise the members of the Board later.

She then appointed the following State Committee Chairmen:

Historian—Mrs. N. O. Ramstad, Bismarck.
Organization—Mrs. Ted Keller, Rugby.
Bulletin—Mrs. F. O. Woodward, Jamestown.
Legislation—Mrs. W. B. Pierce, Bismarck.
Public Relations—Mrs. W. A. Wright, Williston.
Press and Publicity—Mrs. L. J. Alger, Grand Forks.
Program—Mrs. A. P. Nachtwey, Dickinson.
Hygeia—Mrs. C. O. Heilman, Fargo.
Revision—Mrs. V. G. Borland, Fargo.
Parliamentarian—Mrs. J. R. Pence, Minot.
Nominating Committee—Mrs. W. F. Baillie, Fargo.

There being nothing further to come before the meeting, it was duly moved, seconded and carried that the meeting be adjourned.

1949 MEMBERSHIP ROSTER
WOMAN'S AUXILIARY TO THE NORTH DAKOTA STATE MEDICAL ASSOCIATION
(Membership by Districts)

First District

President: Mrs. B. C. Corbus, Jr. — Fargo
Secretary: Mrs. R. E. Lewis — Fargo

Bacheller, Mrs. S. C.	Enderlin
Baillie, Mrs. W. F.	719 Broadway, Fargo
Bateman, Mrs. C. V.	529 Fourth St. N., Wahpeton
Beithon, Mrs. E. J.	429 Fifth St. N., Wahpeton
Beltz, Mrs. M. E.	207 Sixth St. N., Wahpeton
Bond, Mrs. J. H.	921 South 9th St., Fargo
Borland, Mrs. V. G.	1514 South 9th St., Fargo
Corbus, Mrs. B. C., Jr.	424 Fourteenth Ave. S., Fargo
DeCesare, Mrs. F. A.	1401 South 9th St., Fargo
Dillard, Mrs. J. R.	620 South 8th St., Fargo
Elofson, Mrs. C. E.	1334 North 3rd St., Fargo
Fjelde, Mrs. J. H.	1526 South 8th St., Fargo
Fortney, Mrs. A. C.	1122 South 9th St., Fargo
Hanna, Mrs. J. F.	907 Twelfth Ave. S., Fargo
Haugrud, Mrs. E. M.	1310 North 3rd St., Fargo
Heilman, Mrs. C. O.	1338 North 2nd St., Fargo
Hunter, Mrs. C. M.	1335 S. 6th St., Fargo
Irvine, Mrs. V. S.	Lidgerwood
Kaylor, Mrs. C. C.	1426 Fourteenth Ave. S., Fargo
Klein, Mrs. A. L.	1441 South 9th St., Fargo
Kellogg, Mrs. I. W.	Fairmount
Lancaster, Mrs. W. E. G.	1437 S. 8th St., Fargo
Larson, Mrs. G. A.	1538 S. 9th St., Fargo
LeMar, Mrs. John D.	1249 N. 10th St., Fargo
Lewis, Mrs. T. H.	121 N. 5th St., Fargo
Long, Mrs. W. H.	1438 S. 8th St., Fargo
Mazur, Mrs. B. A.	1237 N. 3rd St., Fargo
Moe, Mrs. Allan E.	1112 Sixth Ave. S., Moorhead, Minn.
Miller, Mrs. H. H.	609 Fourth St. N., Wahpeton
Ostfield, Mrs. J. H.	1120 Fifth Ave. S., Fargo
Poindexter, Mrs. M. H.	721 S. Fourth, Moorhead, Minn.
Pray, Mrs. L. G.	1526 S. Seventh St., Fargo
Richter, Mrs. E. H.	Hunter
Rodgers, Mrs. R. G.	1217 S. Seventh St., Fargo
Sasse, Mrs. Sophia	Lidgerwood
Schneider, Mrs. J. F.	11 N. Eleventh St., Fargo
Sedlak, Mrs. O. A.	1406 S. Eighth St., Fargo
Stafne, Mrs. W. A.	1409 S. Ninth St., Fargo
Swanson, Mrs. J. C.	1220 S. Eighth St., Fargo
Schleinitz, Mrs. F. B.	Hankinson
Weible, Mrs. R. D.	1630 S. Ninth St., Fargo
Weible, Mrs. R. E.	714 S. Eighth St., Fargo
Thompson, Mrs. A. M.	313 Seventh St. N., Wahpeton
Wasemiller, Mrs. E. R.	531 First St. N., Wahpeton

Devils Lake

President: Mrs. L. S. Gerber — Lakota
Secretary: Mrs. R. M. Fawcett — Devils Lake
Treasurer: Mrs. W. R. Fox — Rugby

Engesather, Mrs. J. A. D.	Brocket
Fawcett, Mrs. D. W.	1105 Fifth St., Devils Lake
Fawcett, Mrs. J. C.	1125 Fifth St., Devils Lake
Fawcett, Mrs. R. M.	816 Ninth St., Devils Lake
Fox, Mrs. W. R.	Rugby
Graham, Mrs. J. D.	510 Tenth Ave., Devils Lake
Gerber, Mrs. L. S.	Lakota
Hughes, Mrs. B. J.	Rolla
Keller, Mrs. E. T.	Rugby
Mahoney, Mrs. J. H.	915 Eighth St., Devils Lake
Palmer, Mrs. D. W.	Cando
Sihler, Mrs. W. F.	412 Seventh St., Devils Lake
Toomey, Mrs. G. W.	418 Seventh St., Devils Lake
Van Lier, Mrs. P. C.	Rugby
Vigeland, Mrs. G. N.	Maddock

Grand Forks

President: Mrs. W. A. Liebeler — Grand Forks
Secretary: Mrs. E. A. Haunz — Grand Forks

Alger, Mrs. L. J.	81 Fourth Ave. S., Grand Forks
Benson, Mrs. T. Q.	1101 Reeves Drive, Grand Forks
Brown, Mrs. G. F.	121 Fenton, Grand Forks
Culmer, Mrs. A. E., Jr.	1503 Oak, Grand Forks
Dailey, Mrs. W. C.	1404 Chestnut, Grand Forks
Flaten, Mrs. A. N.	Edinburg
Goehl, Mrs. R. O.	1015 Reeves, Grand Forks
Haugen, Mrs. C. O.	Larimore
Haunz, Mrs. E. A.	1027 Lincoln Drive, Grand Forks
Johann, Mrs. O. P.	Grafton
Landry, Mrs. L. H.	Walhalla
Leigh, Mrs. R. E.	17 Conkling Ave., Grand Forks
Liebeler, Mrs. W. A.	619 Belmont Road, Grand Forks
Lommen, Mrs. C. E.	Fordville
Sandmeyer, Mrs. J. A.	1722 University Ave., Grand Forks
Stratte, Mrs. J. J.	403 Division Ave., Grand Forks
Sterns, Mrs. Donald	1302½ University Ave., Grand Forks
Thorgrimson, Mrs. G. G.	1215 Lincoln Drive, Grand Forks
Vance, Mrs. R. W.	75 Fourth Ave. S., Grand Forks
Waldren, Mrs. H. M., Jr.	Drayton
Waldren, Mrs. H. M., Sr.	Drayton
Weed, Mrs. F. E.	Park River
Witherstine, Mrs. W. H.	214 Eighth Ave. S., Grand Forks
Woutat, Mrs. P. H.	1205 Lincoln Drive, Grand Forks

Kotana

President: Mrs. A. K. Johnson — Williston
Secretary-Treasurer: Mrs. J. J. Korwin — Williston

Craven, Mrs. J. D.	915 Second Ave. W., Williston
Craven, Mrs. J. P.	409 Third Ave. E., Williston
Hagan, Mrs. E. J., Sr.	410 Second Ave. E., Williston
Johnson, Mrs. A. K.	717½ Second Ave. E., Williston
Korwin, Mrs. J. J.	701 Second Ave. E., Williston
Lund, Mrs. C. M.	701 First Ave. E., Williston
Wright, Mrs. W. A.	822 Second Ave. E., Williston

Northwest

President: Mrs. Henry Kermott — Minot
Secretary: Mrs. O. S. Uthus — Minot
Treasurer: Mrs. R. B. Woodhull — Minot

Ball, Mrs. W. J.	405 Thompson Apts., Minot
Beck, Mrs. Charles	Harvey
Bethea, Mrs. R. O., Jr.	121 Ninth Ave. N.W., Minot
Brelich, Mrs. P. J.	818 Fourth St. S.E., Minot
Cameron, Mrs. A. L.	318 Eighth Ave. S.E., Minot
Combs, Mrs. A. B.	624 S. Main, Minot
Conroy, Mrs. M. P.	301 Thompson Apts., Minot
Devine, Mrs. J. L., Jr.	901 Fourth St. S.E., Minot
Duane, Mrs. T. D.	118 Ninth Ave. S.E., Minot
Erenfeld, Mrs. H. M.	306 Ninth St. S.E., Minot
Erenfeld, Mrs. F. R.	616 Lincoln Ave., Minot
Fischer, Mrs. V. J.	707 Third St. S.E., Minot
Garrison, Mrs. M. M.	612 Mt. Curve Ave., Minot
Goodman, Mrs. Robert	Powers Lake
Haraldson, Mrs. Olaf	918 Second Ave. S.E., Minot
Halverson, Mrs. H. L.	912 Second St. N.W., Minot
Ingalls, Mrs. C. L.	434 Fifth Ave. N.W., Minot
Johnson, Mrs. H. P.	1124 Eighth St. N.W., Minot
Johnson, Mrs. O. W.	Rugby
Kermott, Mrs. Henry	21 Seventh St. N.W., Minot
Kernwein, Mrs. G. A.	809 First St. S.E., Minot
Lampert, Mrs. M. T.	101 Tenth St. N.W., Minot
Lyman, Mrs. F. V.	M.S.T.C., Minot

McCannel, Mrs. A. D. 505 Main St. S., Minot
Naegeli, Mrs. F. D. 920 Third Ave. N.W., Minot
O'Neill, Mrs. R. T. 529 Third St. S.E., Minot
Peabody, Mrs. C. S. 201 Thomas Apts., Minot
Pence, Mrs. J. R. No. 4 Emerson Apts., Minot
Dyson, Mrs. R. E. 717 Fourth St. S.E., Minot
Hurly, Mrs. W. C. 920 Third Ave. S.E., Minot
Ransom, Mrs. E. M. 715 First Ave. N.W., Minot
Rowe, Mrs. H. J. 517 Second St. S.E., Minot
Seiffert, Mrs. G. S. P.O. 389, Minot
Smith, Mrs. J. A. 412 Seventh St. N.W., Minot
Spomer, Mrs. J. P. 115 Seventh St. S.E., Minot
Sorenson, Mrs. A. R. 114 Sixth St. S.E., Minot
Sorenson, Mrs. Roger 1000 Fourth Ave. N.W., Minot
Uthus, Mrs. O. S. 301 Thomas Apts., Minot
Woodhull, Mrs. R. B. 203 Thompson Apt., Minot

Sheyenne Valley

President: Mrs. W. H. Gilsdorf Valley City
Secretary-Treasurer: Mrs. C. J. Meredith Valley City

Cook, Mrs. P. T. Valley City
Christianson, Mrs. Gunder Valley City
Gilsdorf, Mrs. W. H. Valley City
Merrett, Mrs. J. P. Valley City
Meredith, Mrs. C. J. Valley City
Macdonald, Mrs. A. C. Valley City
Macdonald, Mrs. A. W. Valley City
Wicks, Mrs. F. L. Valley City
Brown, Mrs. Nida Valley City
Crosby, Mrs. Kate Valley City

Sixth

President: Mrs. C. A. Arneson Bismarck
Secretary: Mrs. P. W. Freise Bismarck
Treasurer: Mrs. C. C. Smith Mandan

Arneson, Mrs. C. A. 714 Second St., Bismarck
Baumgartner, Mrs. C. J. 615 Washington, Bismarck
Bahamonde, Mrs. J. B. Elgin
Berg, Mrs. H. M. 214 Avenue A, Bismarck
Brandes, Mrs. Marion E. 601 Fifth Ave., Bismarck
Boerth, Mrs. E. H. 610 Avenue B, Bismarck
Breslin, Mrs. R. H. 107 First Ave. N.W., Mandan
Buckingham, Mrs. T. W. 1030 Fifth Ave., Bismarck
Constans, Mrs. G. M. 621 Mandan St., Bismarck
DeMoully, Mrs. O. M. Flasher
Diven, Mrs. W. L. 119 Ave. B West, Bismarck
Fredricks, Mrs. L. H. 112 Ave. B West, Bismarck
Freise, Mrs. P. W. 831 Mandan, Bismarck
Gaebe, Mrs. O. C. New Salem
Icenogle, Mrs. G. D. 232 Ave. C West, Bismarck
Jacobson, Mrs. M. S. Elgin
LaRose, Mrs. V. J. 522 Sixth St., Bismarck
Larson, Mrs. L. W. 219 Ave. B West, Bismarck
Nickerson, Mrs. Evelyn 309 Fifth Ave. N.W., Mandan
Nuessle, Mrs. R. F. 106 Ave. D, Bismarck
Perrin, Mrs. E. D. 102 Ave. D, Bismarck
Peters, Mrs. Clifford 220 Ave. A West, Bismarck
Pierce, Mrs. W. B. 615 Raymond, Bismarck
Ramstad, Mrs. N. O. 824 Fourth St., Bismarck
Roan, Mrs. M. W. 222 Park St., Bismarck
Rosenberger, Mrs. H. P. 404 Ave. C, Bismarck
Salomone, Mrs. E. Elgin
Saxvik, Mrs. R. O. 622 Eighth St., Bismarck
Schoregge, Mrs. C. W. 507 Sixth St., Bismarck
Smith, Mrs. C. C. 503 Third St. N.W., Mandan
Thompson, Mrs. Arnold 1124 Fourth St., Bismarck
Vinje, Mrs. E. G. Hazen
Waldschmidt, Mrs. R. H. 600 Washington, Bismarck

Southwestern

President: Mrs. A. P. Nachtwey Dickinson
Secretary-Treasurer: Mrs. A. J. Spanjers, Jr. Dickinson

Bowen, Mrs. J. W. 221 Seventh Ave. W., Dickinson
Dukart, Mrs. C. R. 208 Fourth Ave. N., Dickinson
Dukart, Mrs. Ralph 46 W. Fifth St., Dickinson
Guloien, Mrs. H. E. 41 Fifth Ave. W., Dickinson
Gumper, Mrs. A. J. 7 E. Fourth, Dickinson
Hill, Mrs. S. W. Regent
Nachtwey, Mrs. A. P. 115 Fifth Ave. W., Dickinson
Olesky, Mrs. E. Mott
Riechert, Mrs. H. L. 543 First Ave. W., Dickinson
Rodgers, Mrs. R. W. 146 West Sixth St., Dickinson
Smith, Mrs. O. M. Killdeer
Spanjers, Mrs. A. J., Jr. 119 Seventh Ave. W., Dickinson
Spear, Mrs. A. E. 610 First Ave. W., Dickinson

Southern

Fergusson, Mrs. V. D. Edgeley
Fergusson, Mrs. F. W. Kulm
Maloney, Mrs. B. W. Lamoure
Van Houten, Mrs. R. W. Oakes
Wolfe, Mrs. F. E. Oakes

Stutsman

President: Mrs. R. D. Nierling Jamestown
Secretary-Treasurer: Mrs. Robert Woodward Jamestown

Arzt, Mrs. P. G. 502 Fourth Ave. S.E., Jamestown
Carpenter, Mrs. G. S. State Hospital, Jamestown
Cuthbert, Mrs. W. H. State Hospital, Jamestown
DePuy, Mrs. T. L. 301 Second Ave. S.E., Jamestown
Elsworth, Mrs. J. N. 605 Fifth Ave. N.E., Jamestown
Jansonius, Mrs. John 405 Fourth Ave. S.E., Jamestown
Larson, Mrs. E. J. 321 Second Ave. S.E., Jamestown
Lucy, Mrs. R. E. 523 Third Ave. S.E., Jamestown
Miles, Mrs. J. V. 420 Fourth Ave. N. E., Jamestown
Nierling, Mrs. R. D. 415 Ninth Ave. S.E., Jamestown
Pederson, Mrs. Thomas 316 Fourth Ave. N.E., Jamestown
Robertson, Mrs. C. W. 106 Sixth St. N.W., Jamestown
Sorkness, Mrs. Joseph 318 Third Ave. S.E., Jamestown
Wood, Mrs. W. W. 509 Second Ave. N.E., Jamestown
Woodward, Mrs. F. O. 722 Third St. N.E., Jamestown
Woodward, Mrs. R. S. 114½ N.E. Third, Jamestown

Traill-Steele

President: Mrs. C. G. Owens New Rockford

Cable, Mrs. T. M. Hillsboro
Cleary, Mrs. H. G. Northwood
Dekker, Mrs. O. D. Finley
Kjelland, Mrs. A. A. Hatton
Knutson, Mrs. O. A. Buxton
LaFleur, Mrs. H. A. Mayville
Little, Mrs. R. C. Mayville
Vinje, Mrs. Syver Hillsboro

Tri-County

President: Mrs. T. M. Cable Hillsboro
Secretary: Mrs. O. A. Knutson Buxton

Boyum, Mrs. P. A. Harvey
Gilliland, Mrs. R. F. Carrington
Owens, Mrs. C. G. New Rockford
Schwinghamer, Mrs. E. J. New Rockford
Voglewede, Mrs. Wm. Carrington

American College Health Association News

PLANS are getting under way for the annual meeting of the American College Health Association at the Henry Hudson Hotel, New York City, December 29-30, 1949. The tentative program is as follows:

The first morning session will be opened by an address by the President to be followed by a scientific session on Evaluation of Screening Programs in College Health Services. At noon there will be the Association luncheon at which a well-known speaker will be present. The afternoon session will be held at the Institute of Rehabilitation and will be devoted to a symposium on Physical Medicine with Dr. Howard Rusk in charge.

Two panel discussions will be held the second morning—one on Health Problems of Women in Colleges, under the guidance of Dr. Ruth Boynton of the University of Minnesota, and the second on the Problems of Recognition and Standards for Health Services, under the direction of Dr. Warren Forsythe of the University of Michigan. The latter panel will probably be made up of former presidents of the Association. A business meeting and a session on Problems of Nutrition as Applied to College Health, with Dr. Norman Jollifee presiding, will wind up the two-day meeting.

Meet Our Contributors

G. Wilson Hunter, M.D., of the Fargo Clinic is a past president of the North Dakota Society of Obstetrics and Gynecology. He is a graduate of Northwestern University Medical School; a member of the Central Association of Obstetrics and Gynecology, the Minnesota Society of Obstetrics and Gynecology, AMA, the Cass County Medical Society, FACS, FISC; and joined the American Board of Obstetrics and Gynecology in 1938.

Dean F. Nelson, M.D., was graduated from Northwestern University Medical School, class of 1943, and later took work at the St. Joseph Hospital in Chicago. He now specializes in obstetrics and gynecology at the Fargo Clinic.

Charles Blair Darner, also of the Fargo Clinic, was graduated in 1937 from the medical school of the University of Michigan and served as lieutenant in the USNR from 1942 to 1946. He is secretary of the North Dakota Society of Obstetrics and Gynecology; a member of the Central Association of Obstetrics and Gynecology, the AMA, and the Cass County Medical Society. He joined the American Board of Obstetrics and Gynecology in 1947.

Budd Clarke Corbus, Jr., M.D., attended Harvard and Louisiana State medical schools. A specialist in urological surgery, he serves as staff member of St. John's Hospital in Fargo, North Dakota, as consultant in the Fargo Veterans Hospital, and urological consultant of the North Dakota Crippled Children's Bureau. He is a member of the Chicago Urological Society, the North Central Section of the American Urological Association, Sigma Xi, a Fellow of AMA, and a Diplomate of the National Board of Medical Examiners.

DR. CARL C. SAN SOCIE was recently appointed college physician on the staff of State Teachers College, a branch of the State University of New York, at Brockport, N. Y.

THE STATE TEACHERS COLLEGE at Brockport, N. Y., has an opening for a medical doctor or doctor of public health for the college year beginning September 1, 1949. The position pays a salary of $5265 for the ten-month college year. Additional money at the rate of $100 a week is paid if the person remains to teach in the six or eight week summer sessions. The salary quoted is the minimum for a full professorship. Annual increments of $250 each for four years bring the maximum $1000 higher. The duties include general supervision of the health services to college students and the children of our School of Practice. This involves annual examinations, clinical services, emergency work and the possible teaching of from three to six hours of courses in one or more of the following fields: anatomy, physiology, bacteriology, public health, personal hygiene, community hygiene.

News Briefs

North Dakota

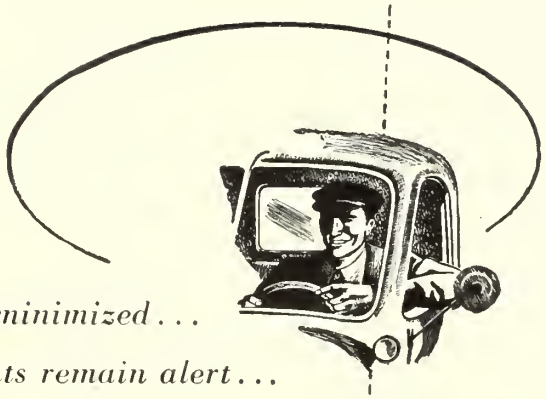
NAMED CHIEF of surgical service at Fargo Veterans hospital is Dr. Fred H. Wiechman, who has served as acting chief since last October. A native of Freeport, Minn., Dr. Wiechman was graduated from University of Minnesota medical school in 1929. Following private practice at Sleepy Eye and Montgomery, Minn., he served five years in the army, and later completed three years postgraduate training for the American Board of Surgery.

ADDITION OF SIX DOCTORS to the Fargo Veterans Hospital staff and a corresponding increase in other personnel has enabled the Fargo VA center to increase the number of hospital beds in use from 227 to 280.

Rated bed capacity of the hospital is 415. The management hopes to open another ward soon, increasing beds in use to 313.

The hospital waiting list, which once numbered several hundred, has been decreasing steadily and the hope of the manager is to open sufficient wards soon to enable the hospital to accommodate applicants with no waiting.

New doctors are Dr. Julius Weinberg, Dr. James B. Blair, Dr. Henry Edstrom, Dr. Dominic Cavalieri, Dr. Donald D. Davis and Dr. Mabel Hoiland.



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GOV. FRED G. AANDAHL reappointed two members and named one new member to the state board of medical examiners. Dr. Joseph Sorkness, Jamestown, and Dr. D. J. Halliday, Kenmare, both were reappointed to three-year terms expiring August 1, 1952. Dr. C. J. Glaspel, Grafton, was named to succeed Dr. G. M. Williamson, Grand Forks, also for a three-year term.

DR. JOHN T. BOYLE, physician and surgeon, Newark, N. J., began practicing in Garrison in partnership with Dr. Martin Hockhauser, who took over the practice of Dr. E. C. Stucke when he retired from the medical profession last December.

Dr. Boyle is a graduate of Holy Cross College and attended New York Medical College, where he was president of his graduating class. Dr. Boyle served internship at Newark City Hospital and took one year of specialized training there.

DR. ANTON ZUKOVSKY, one of the first DP physicians to undertake training in the United States, is beginning a year's work in St. Aloisius hospital at Harvey, N. D. Following the training here Dr. Zukovsky will take the state board examinations and is scheduled to practice at Steele, N. D.

Dr. Zukovsky is Polish by birth and is a graduate of the medical school at the famous University of Cracow. He was chief doctor of Polish hospitals for seven years and for four years worked in DP camps under the supervision of the United States army.

DR. GEORGE C. HANSON of Minot, physician, surgeon and specialist on eye, ear, nose and throat, has announced his retirement after 33 years in Minot. He and Mrs. Hanson will make their home in Seattle.

DR. F. M. WALSH has recently taken the North Dakota medical examination and secured his license to practice in the state. Dr. Walsh, who came from Winnipeg, is associated with Dr. H. M. Waldren, at Drayton.

DR. D. J. HALLIDAY, chairman of the Kenmare Deaconess hospital board, recently accepted a check for $1,585.00, from Byron Krantz, secretary-treasurer of the American Legion hospital benefit project. The check was earmarked for the purchase of a new operating room table for the hospital.

South Dakota

SOUTH DAKOTA has 14 newly licensed medical doctors. The young physicians were approved by the newly-formed state board of medical and osteopathic examiners' meeting at Pierre July 19th, in its first official session since it was created by the 1949 lesgislature.

In addition to processing the new doctors, the board also administered examinations to four other physicians, set up internship regulations and elected its own officers. Faris Pfister, Webster, was named president; J. H. Cheney, Sioux Falls, vice president; and C. E. Sherwood, Madison, secretary. Other members of the board are C. B. McVay, Yankton, and D. L. Kegaries, Rapid City.

The newly licensed physicians and their places of practice are: J. W. Donahue, W. R. Anderson, A. K. Myrabo and D. F. Rayl, all in Sioux Falls; J. E. Harroun, Brookings; A. B. Scales, Pickstown; K. M. Keane, Elk Point; D. J. Glood, Viborg; J. W. O'Brien, Winner; A. J. Miller, Aberdeen; C. W. Hogan, J. V. Yackley, and P. H. Koren, all in Rapid City; and F. C. Tucker, Vermillion.

DR. DONALD F. RAYL has opened an office at the Sioux Falls clinic for the practice of general and thoracic surgery. Dr. Rayl received his M.D. at the Johns Hopkins university school of medicine in February, 1943. He is an associate staff member of the McKennan and Sioux Valley hospitals, a member of the American Trudeau society, and the attending physician in thoracic surgery at the Royal C. Johnson Veterans hospital.

GOV. MICKELSON reappointed Dr. R. B. Fleeger, Lead, to the medical panel provided for by the South Dakota occupational disease disability law.

The appointment is effective through July 1, 1955. Other members of the medical panel are Dr. Donald H. Breit, Sioux Falls, and Dr. J. L. Calene, Aberdeen.

DR. JOHN W. DONAHOE has joined his father and brother, Drs. S. A. and Robert R. Donahoe, in practice at Sioux Falls.

Dr. Donahoe received his M.D. at the Georgetown School of Medicine in 1943. He interned at the Georgetown university hospital during part of 1944. He began a fellowship at the Mayo clinic, Rochester, Minn., October 1, 1944, leaving in July, 1946, to enter the army, but later completed it following his discharge.

ANNOUNCEMENT was made of the association of Dr. Wilford A. Councill, who becomes a member of the staff at the Clark Medical Clinic.

Dr. Councill, a former resident of Baltimore, Maryland, is a graduate of the University of Virginia and served his internship at Johns Hopkins Hospital. He has had special training in urological surgery.

DR. N. W. STEWART of the Homestake Mining Company hospital staff at Lead, was recently appointed assistant chief surgeon succeeding Dr. N. E. Mattox, who has retired.

Dr. Stewart has been on the Homestake medical staff since January, 1931. He is a graduate of the University of Minnesota School of Medicine with the class of 1927 and practiced at Brainerd and Mankato, Minn., before coming to Lead.

Dr. Mattox plans to continue special practice in eye, ear, nose and throat in the offices formerly occupied by the late Dr. W. L. Matlock in Deadwood.

DR. SAM NAMMINGA of Scotland, S. D., will accept a position as a civilian doctor in the Veterans Hospital at Ft. Mead near Sturgis, S. D. A number of years ago he purchased the Scotland Clinic from its founder, Dr. Landmann, and since then has had a large practice embracing a wide area around Scotland.

The JOURNAL LANCET

Minneapolis, Minnesota
October, 1949

Vol. LXIX, No. 10
New Series

Cancer Symposium: A Foreword

Only a few years ago many cancers went undiagnosed and the resultant deaths were ascribed to other conditions. However, significant advances and diagnostic procedures have been made in recent years. Endoscopy, for instance, has contributed significantly to diagnosis of malignancy by making it possible to procure biopsy material from suspicious lesions and obtain aspirations for microscopic study. X-ray inspection has been helpful during the last decade or so in determining the presence of lesions in such organs as the stomach and the lung, and locating areas of disease which can be investigated by other methods with reference to etiology.

In this issue of JOURNAL-LANCET, McDonald and Woolner bring to date our knowledge on cytological diagnosis of carcinoma. The value of this procedure is emphasized, particularly in carcinoma of the uterus and lungs.

Probably every localized primary cancer could be cured by surgical removal if its presence were known and its location determined at the right time. In Hilger's article, *Carcinoma of the Larynx,* Hilger states that early diagnosis coupled with adequate therapy can in a mid-vocal cord lesion of small size promise a 92 per cent five-year cure rate. The accessibility of this area to examination makes early diagnosis possible if the individual is seen by a physician who does an adequate examination.

Dodds in his article calls attention to Ochsner's statement that of every 25 cases of carcinoma of the lung, only nine are suitable for pulmonary resection, and only two of the nine survive five or more years. Thus the vast majority of lung cancer patients cannot be treated successfully by surgery because of metastases before operations are performed.

The article "The Cancer Problem Today," by Wangensteen is a fine, over-all presentation of the entire cancer situation. He leads the reader into every phase of this field and states not only what is known, but what is still needed to solve the problem.

J. A. MYERS, M.D.

The Cancer Problem Today

Owen H. Wangensteen, M.D.†
Minneapolis, Minnesota

ANYONE who has concerned himself with some of the serious aspects of the cancer problem must confess to a feeling of awe and bewilderment before the confusion and the unsolved mysteries of cancer. We know very little about cancer; it would be foolhardy to deny this.

The scope of the cancer problem has broadened in our day to touch the interests and include the activities of chemists, physicists, biochemists, histochemists, biophysicists, geneticists, zoologists, biologists, biometricians, morphogeneticists, physiologists, virologists, enzymologists and experimentalists in the broad interphases between these recognized specialists, as well as endocrinologists, hematologists, pathologists, oncologists, roentgenologists, radiotherapeutists and surgeons and many surgical specialists. I disclaim any intent of trying to portray the present status of the cancer problem from any other point of view than that of a clinical surgeon, nor is my perspective broad enough to correlate for you the significant advances in each of these fields. Historically it is of interest that whereas studies of organ structure date back for centuries, the study of function is essentially a modern development. It is reasonable to believe that new disciplines will come into being between the interphases of chemistry, physics and endocrine physiology to help resolve the enigma.

The ancient military axiom of divide and conquer is still ultra-modern even for the understanding of such a problem as that posed by cancer. If a young scholar were, with the promise of long life, to outline for himself the laudable objective of mastering all the knowledge bearing upon cancer, I think he would die in the first library alcoves of available cancer literature. Despite the enormity of the literature, the salient facts are still too few. Moreover, persons capable of synthesizing already existing and related facts into workable concepts are fewer still. Getting the available information into the hands of those to whom it has some meaning is also imperative. The gleaners whose bits of information narrow the borders between interphases of specialty knowledge always make an important contribution to the understanding of a problem.

*A lecture sponsored by the Minnesota chapter of Sigma Xi and given at the Northrop Memorial Auditorium February 20, 1948.

†From the Department of Surgery, University of Minnesota Medical School.

This presentation is based upon work prosecuted under the following sources of support: Grants from the National Cancer Institute and include the following local sources of support for cancer research: 1. Flora L. Rosenblatt Fund, 2. Malignant Disease Research Fund, 3. Donald P. and Marian S. Ordway Fund, 4. Mr. and Mrs. R. C. Lilly Fund, 5. Mr. and Mrs. L. A. Pritzker Fund, 6. Tillie L. Nelson Fund.

WHAT IS CANCER?

Cancer though local in origin is probably not the result of a single insult. In other words, the factor or factors responsible for bringing a malignant tumor into being in one organ or tissue may be inoperative in another. The mystery of the beginnings of cancer is as baffling as are the questions hedging about the origins of life itself. The ways of nature are not simple. He who professes an interest in the biology of cancer has much to learn concerning the factors which influence the rapidity as well as the character of cell division and growth. When we have a better understanding of the natural processes of growth, we shall be able to appraise in a more intelligent manner the intangible unknowns which hover about the beginnings of cancer. As the following discussion will suggest, it is more than likely that different agents or varying combinations of agents may be responsible for inciting the beginnings of cancer in various organs of the body.

Much has been learned from the chimney sweep's cancer of the scrotum, described by the Englishman, Percival Pott, in 1775. The Japanese observers, Yamagiwa and Ichikawa (1915), found that tar painted on the ears of rabbits resulted in the production of skin cancers. The demonstration of carcinogenic properties of chemicals (dibenzanthracene) isolated from tar by Kennaway and his associates (1924) was the first step in classifying the nature of the origin of skin cancers. Demonstration of carcinogenic substances in the sex hormones was another important step. And just in the same manner that x-rays or radium are curative agents for certain cancers, within doses that are safe for the skin, and carcinogenic when the dose applied is caustic, so the sex hormones may produce cancer in mice and when administered to man, may not uncommonly be followed by temporary disappearance of certain cancers, especially breast and prostatic. This dual effect of the x-rays and sex hormones is shared by at least one other agent, urethrane, which has been used to treat leukemia and prostatic cancer in men. While the administration of urethrane may reduce the white blood cell count in mice with leukemia, it may at the same time induce malignant tumors of the liver (Kirschbaum, 1948).

Those forces in the body limiting physiological growth have no control over cancerous growth, which is terminated only by the death of the host. Cancer is essentially a disease of a group of cells in a certain tissue. Cancer of the skin is the most frequent of all cancers. Fortunately, about 90 per cent of skin cancer occurs below the wristline of the hand and above the collar line, which suggests that its causes are largely external or environmental; that long exposure to sunlight and wind

has brought it about; that the development of a cancer on the skin of the face or the back of the hand was preceded by a local *precancerous* condition which in turn was brought into being by exposure to the ultraviolet light or actinic rays of sunshine. These precancerous conditions identified ordinarily as small, rough, pigmented excrescences on the skin look innocent enough and often remain unchanged for long periods of time. Insidiously, growth and ulceration, occasionally heralded by pain, indicate that they are not as harmless as their apparent inertness had suggested.

Tissue Susceptibility

Now, whereas skin cancer is essentially an environmental disease, appearing in older persons, whose hands and faces have long been exposed to sun and wind, there is a wide divergence in tissue susceptibility. The Negro, having more pigment in his skin, is almost immune to skin cancer and when he does have it, is apparently as likely to exhibit it in covered portions of his body as on exposed surfaces. Light-complexioned, fair-haired persons, on the contrary, now and then exhibit unusual sensitiveness to sunlight to the extent that moderate exposure at an early age invites the development of cancer —a condition known as Xeroderma pigmentosum. If these persons are to avoid cancer, they must live in a dark cellar or venture out only when dressed up like a Crusader going to fight the Saracens.

Tissue susceptibility to cancer, though well documented for various conditions of life, is not well understood. Whether organ susceptibility results from a systemic or a local influence is not generally known. The term "precancerous lesions" is used with some justification in speaking of skin keratoses on the face or hands and in polyps of the rectum, colon, stomach, bladder and larynx. However, it is very unlikely that polyps are the precursor of most gastric cancers; if there are local precursors of breast, uterine and lung cancer, we do not know what they are. Whether it is local or systemic, whether genetic, environmental or hormonal remains to be resolved. And obviously all these factors may participate and to varying extents in different organs.

Civilization and Cancer

Cancer, it is frequently said, is an accompaniment of civilization. It must be remembered, however, that one of the benefactions of advance from barbarism and primitive societies is longer life. And, as length of life increases, death from cancer increases in a more than arithmetic progression. Approximately 90 per cent of cancer occurs after 40 years of age. Wherever people live to be old, no matter where or under what environmental conditions, cancer is frequent. A study of the comparative mortality from various countries supports this thesis. In India, where the average life expectancy at birth is approximately 26 years, cancer occurs, but by no means as frequently as in those countries where the life expectancy is more than 60 years, including most countries of western and northern Europe, North America, Australia, New Zealand and the Union of South Africa. Similarly, in Japan, Italy and Portugal, where life expectancy is still considerably lower (46 to 56 years) than in Western Europe and here the overall mortality from cancer is also less than here. As the longevity in these countries approaches our own, it is likely that the apparent difference in cancer mortality will also become less marked. Civilization is probably an abettor of cancer only insofar as it creates the opportunity for more people to live to be old.

Frequency of Cancer

The sources of information on the occurrence of cancer are the following: (1) vital statistics of the various countries (published and prepared for the United States under the supervision of the Census Bureau); (2) statistical surveys of illness and death among policyholders of large insurance companies; (3) diagnoses from hospital charts; (4) autopsies; and (5) tumor and cancer registries in states requiring the reporting of observed cancer.

In the mortality tables of the vital statistics, the opportunities for error are obvious. In general, however, vital statistics and postmortem studies agree quite well as to the frequency of the various kinds of cancer, with deaths in the postmortem series favoring a larger proportion of deaths from internal cancers.

Clinical hospital diagnoses, checked by autopsies (Nagayo 1933; Pohlen and Emerson 1942) suggest that cancer probably occurs more frequently than is indicated by clinical studies alone, perhaps by an additional 20 to 30 per cent over reported clinical incidences. And it is probably fair to suggest that a similar underevaluation of cancer frequency is present in the vital statistics, for patients do die without the advantage of hospital study.

All sources of information confirm the impression that cancer is a common disease. In fact, cancer accounts for one among 8 deaths in this country counting all ages of life. Among men in the United States, one death in 9 is due to cancer; among women, one in every 6.5. In the years between 40 and 60, more than 25 per cent of all deaths in women in this country are caused by cancer. Women live to be older, and this may in part account for the larger mortality from cancer in women. Another reason may be the fact the cancers which take the greatest toll among men are largely internal cancers, not readily recognized; in women, on the contrary, cancers of the uterus and breast are the frequent cancers and more easily detectable.

Age Incidence of Various Cancers

Cancer is no respecter of persons. It attacks the infant in his crib; the child at play; the person on the threshold of a career; men in military service; it may work its wrath upon the man in prison or seek out the public benefactor.

In the early years of life, in both sexes, leukemia, tumors of the brain, bone and kidney are the most frequent cancers. Some of these continue to occur throughout

the life span, becoming relatively less important only because they are superseded in frequency by other cancers. Among men in the middle twenties, cancer of the testis is the most frequent tumor, though measured against the broader background of the overall cancer incidence, it does not appear important. Among women in the same age group, cancer of the breast and uterus take an early lead, which they maintain throughout most of life, outdistanced only in the upper age brackets by cancer of the stomach and the large intestine (colon and rectum considered together). In the male, cancer of the stomach, large intestine (colon and rectum) and the prostate take the largest toll. The first two begin to loom formidably at 45 to 50 years of age, whereas cancer of the prostate takes an increasingly larger toll each year from 60 well up into the eighties.

Environmental or Genetic Differences in Cancer Incidence

A number of studies suggest that the overall incidence of cancer mortality is approximately the same among people with similar life spans. It is not always easy to separate what might be a genetic from an environmental influence. Although the frequent occurrence of breast cancer among certain strains of mice had been looked upon as the inheritance of a genetic influence, Bittner (1936) showed by a relatively simple experiment that an important factor in this transmission was the suckling of the mother by the infant mice. If the young were removed immediately at birth and were foster fed by a lactating mother from a non or low cancer strain of mice, the incidence of cancer in the litter fell sharply. This finding has been amply confirmed. Moreover, the influence of the milk-factor may be largely set aside—at least in certain susceptible strains of mice—if the ovaries of the young females, who might otherwise develop breast cancer, are removed shortly after birth. Further, severe caloric restriction to the extent that fertility of the ovary is compromised also results in a low incidence of breast cancer among susceptible mice. In other words, in these mice the hereditary (genetic), environmental (milk factor), and the hormonal (ovary) influences cooperate in producing breast cancer.

It should be noted that the food shortage endured by the peoples of England and Wales, Holland, Denmark and Norway from 1940 to 1945 did not reduce the death rate from cancer in these countries, as indicated in the vital statistics.

Is Cancer Hereditary?

Although in mice the influence of heredity is distinctly important, the evidence is by no means so clear among humans. The development of a pure strain of mice in which the influence of heredity presupposes that inbreeding—brother-to-sister mating—has been continued for 20 generations. Obviously no race of people today presents that type of genetic control for observation. On the contrary, people who are Jewish, Scandinavian, or no matter what for generations, are by contrast heterozygous, as is even more definitely the typical American. Nevertheless, there are circumstances which suggest a certain tendency to inheritance of cancer in the same organ at about the same age as cancer was observed in the parent. If this occurrence held true generally, the problem of cancer detection would be far simpler than it is. But whereas a mouse may have one or two definite cancer susceptibilities, the human has many. All of us carry within our bodies the latent seeds of many illnesses including perhaps several kinds of cancer which have no opportunity to develop because we die of something else in the meantime.

The patient with Xeroderma pigmentosum does not inherit cancer, but a special susceptibility to the damaging effects of actinic rays; so similarly with mice and the milk factor.

Importance of Age in Cancer Frequency

One thing is clear, cancer is decidedly a disease of advancing years. If every infant born alive were to escape death from whatever cause till age 60, it is evident that the number of persons dying from cancer would be increased enormously.

However much we like to glory in the accomplishment of pediatrics and public health measures in reducing the mortality of children, it is indeed a real challenge to medicine that of 100 infants born alive, a greater number will die in the first year than in any other year of their life span. In fact, there is a larger mortality among infants in the first year of life in the United States than there will be in that same group during the next 29 years! Cancer is responsible for a negligible number of first-year deaths and only 10 per cent of the mortality is due to congenital malformations. Obviously here is an area in which there is still room for considerable improvement.

I think it may be said, men are quite indifferent concerning *what* they may die of; they are concerned of *how* and *when* death will overtake them in their journey between two unknown shores. We want the excursion to be as long and as pleasant as possible. And when our leaky vessels sink, we wish them to submerge swiftly, silently and without suffering.

It is the surgeon's misfortune to observe too often the recognition of cancer after it is too late to do anything about it. It is his privilege, too, to observe with what dignity and resignation people generally accept that unwelcome verdict. If those of us who suffer from imagined ills or are unhappy because fortune has dealt less kindly with us than we would have her do, could emulate the courage of those who must accept with equanimity the fate of the late cancer sufferer, what good medicine it would be for us. The difficulty, however, is to recognize which threatening ills are real. Cancer is not a disease to be fought in its early phases with a defeatist attitude.

Society's Interest in the Individual

There should be no stigma nor disgrace attached to having cancer. Cancer is not contagious. Early disclos-

ure to the physician of the suspicion of cancer is desirable not only in the interest of that individual, but of his family and society as a whole. The late cancer is easy to recognize and difficult to cure; the early cancer is often easy of cure, but difficult to recognize. It costs the individual or society a great deal to treat the late cancer; it will cost money and effort to recognize the early cancer, but it is a far more profitable expenditure. I believe you will agree with the admonition that we heed the cost less and the result more.

Because cancer is primarily a problem of advancing years, every society with an increasing number of old people must reckon with it. There are probably still a few skeptics about who believe that the chief contribution of the medical profession is prolonging the lives of the unfit, and who believe that we are undermining the Spartan vigor of society by our misguided efforts. However, I hold that the mission of physicians is not to attempt to doctor society as well as the patient. Our authority comes from society and those of us who have assumed the Hippocratic Oath must continue to strive to prolong life and relieve suffering.

The Surgeon's Accomplishment in Late Cancer

A development which has been evolving slowly, in many surgical clinics, and particularly in this country, is demonstration that radical surgery can be undertaken in patients with somewhat advanced visceral cancer with relatively low operative risks. Several things have contributed to this improvement, most important of which are better anesthesia, better preoperative preparation of the debilitated patient, employment of more precise operative techniques, and more intelligent management of the postoperative recovery period. The constant lament of surgeons, however, is that we are working largely with late cases. Even for the late case, the accomplishment of the surgeon is real. Our constant hope is that we may have earlier cases to deal with. When cancer can be detected readily in its early stages, it will cease to be the dread affliction it is now.

The Latent or Silent Interval of Visceral Cancers

Unfortunately, cancer of the viscera, the most frequent of lethal cancer, is silent; that is, frank cancer is present some time before it asserts itself and causes functional disturbances of the organ upon which it is parasitic. And in some organs, such as the colon or rectum, there is frequently a local precursor, the polyp from which the cancer begins. Moreover, these polyps in the colon and rectum are often inert and relatively symptomless for long periods of time, occasionally for two years or more; in the stomach, the latent interval of transition between innocence and malignancy is probably even longer. In excisions for gastric cancer, when the pathologist finds upon microscopic examination of the tissue removed that cancer was left in the proximal line of resection, although the surgeon has removed all other visible traces of the disease, the interval before recurrence of symptoms is ordinarily 15 to 20 months and occasionally longer. This observation repeated in several patients affords some idea of the latency of actual cancer. How much longer the interval is between conversion of a precursor into cancer is not definitely known.

Importance of Early Diagnosis

The importance of early diagnosis in overcoming cancer is well documented. As long as cancer is a local disease in the organ where it began, the cure rate by effective therapy is high. When the lymph nodes, the first area beyond the original site, become infested with cancer, even though they too are dealt with, the possibilities for cure are decreased considerably.

Until we have a biologic test by which the presence of cancer can be detected in its earliest phases, one of the intelligent and practical ways to fight the enemy is the Cancer Detection Clinic. Whereas cancer may come at any time, more than 90 per cent of deaths from cancer occur after the age of 40. In women there is a sharper rise in cancer incidence at 30 years than in men, suggesting that attendance at the Cancer Detection Centers should begin at 30 years of age for women and 40 for men. However much we deplore the patient's failure to heed portentous symptoms, the delay occasioned by the long silent interval of visceral cancers is even more damaging to the prospect of a satisfactory cure.

The Cancer Detection Center is by no means the final answer to the early recognition of cancer, but it is one of the best means we have today. Surveys suggest that from one to three per cent of those persons presenting themselves for examination are found to have signs of beginning cancer. The labor involved in examining a patient to tell him or her that he or she does not have cancer, is real. Moreover, the detection of a lesion in the breast, cervix, stomach, colon or rectum indicates that a tumefaction or ulcerous defect is already present. Yet we know that the detection of lesions in this stage is, in the main, synonymous with the promise of a satisfactory result, providing such lesions are dealt with promptly. It is delay that spells defeat. Alertness to the possibility of cancer, re-enforced by careful periodic organ scrutiny, employing the best available diagnostic resources, must replace the old passive policy of wait and see.

Dissatisfaction with Present Methods

Much as we extoll the Cancer Detection Center today, we are hopeful that it in turn will be replaced by more delicate and precise techniques of examination. Detection of a cancer when a palpable tumor or a large ulcerous defect is present is far from satisfying. We would like to be more certain that negative findings would exclude with definitiveness an incipient cancer. If we could only know in *which* patients a cancer was developing, the finding of *that* cancer would be a simpler task than at present. Battles always have to be fought, however, with the weapons and ammunition available.

The labor involved in detecting internal cancers is considerable, yet there is no substitute for the systematic

scrutiny of organs in which cancer is often found. It becomes mandatory, therefore, to survey a large number of people, some of whom may never have cancer, to detect its presence in someone who harbors it unknowingly. We may never be able to prevent the development of cancer, but with consistent early diagnosis, we shall be able to reduce materially its threat to life. To that extent, cancer is preventable as well as curable.

Special Techniques

Papanicalaou of the New York Hospital has shown in early cases of uterine cancer that the diagnosis may be made from the vaginal secretions when properly stained. This technique has been used with considerable success in the detection of cancer of the lung from bronchial secretions, and bids fair to be helpful in many areas of the body.

While a surgical intern, my colleague Dr. George Moore (1947), observed that brain tumors, whether benign or malignant, have an affinity for fluorescein injected intravenously. The nature of the concentration of the dye, whether by the tumor or its stroma, is such that use of this technique by the brain surgeon will become a *sine qua non* in helping him decide, in the presence of infiltrating, uncircumscribed tumors, when he has gotten beyond the lesion. Moreover, Moore (1948), by introducing radio-active iodine into the fluorescein molecule and going over the head of a patient suffering from conjectured brain tumor with a Geiger-Mueller counter, has been able to tell (1) whether he has a tumor; (2) where it will be found; and (3) something of its grade of malignancy, in that the more benign tumors exhibit less affinity for the dye. In addition, non-tumorous conditions such as brain abscess or subdural hematoma give negative findings. This use of a vital dye in the detection of a neoplasm constitutes an important advance in diagnosis to be followed, we hope, by the finding of other vital dyes which exhibit similar affinities for more frequent types of cancer.

Separation of Environmental and Genetic Factors

The importance of the genetic factor in skin cancer already has been pointed out; however, the exposure to actinic rays of the sun is an even more important agent. The Kennaways have shown that, among workers doing heavy manual labor not exposed to tar, pitch or lubricating oils, cancer of the scrotum though far less frequent than among workers with coal tar products—occurs more commonly than among white-collar workers. In other words, those who by choice or for social reasons find it necessary to wash often are immune from scrotal cancer. Cancer of the vulva in the female is an old lady's cancer. It may well be, too, that liberal use of soap and water for the removal of sebaceous secretions may lessen the threat of that cancer in the same manner that soap and water protects against the occurrence of scrotal cancer in the professional worker.

In this connection, the immunity of the Jewish male to cancer of the penis deserves mention. To be sure, in this country it is a rare cancer—according to hospital figures responsible for only 1 to 3 per cent of cancers among males. Among Jews the world over it is practically non-existent. Whether this is a genetic influence or an unexpected gratuity from the ritual of circumcision is not known. There is, however, good reason to believe that the prevention of accumulation of smegma under an adherent prepuce by the liberal use of soap and water constitutes an excellent antidote for cancer of the penis. Leitch (1924) has shown that sebaceous material coming from dermoid cysts of the ovary increases the carcinogenic properties of oils which cause cancer when rubbed on the skin of mice. Moreover, it has been suggested by Twort and Bottomly (1932) that the retention of sebaceous-like secretion in the breast may be one of the important causes responsible for the frequency with which cancer affects it. In countries where sex hygiene is poor by our standards, the incidence of cancer of the penis is far greater than here. In India and China, cancer of the penis accounts for a surprisingly large fraction of the total deaths from cancer among males. It is probably safe to conclude that circumcision, if need be, and the liberal use of soap and water will prevent cancer of the penis. Moreover, in the prevention of cancer of the scrotum and vulva, soap and water are probably equally as important.

Among cancers which are frequent, it is of interest that cancer of the uterine cervix in women is far less frequent in Jewish women than among other peoples. This is true the world over and is well documented. The strange part of it all is that whereas there appears to be a large salvage of life among Jewish women from a cancer which ordinarily takes a large toll, yet the overall mortality from cancer among Jewish women, no matter where they live, is at least as great as among their Gentile sisters in the same environment.

Among countries of our own culture, where people live to approximately the same age, although there are differences in the organ distribution of cancer, the overall mortality is much the same. This suggests there may be an internal drive with reference to the occurrence of cancer that is seeking expression. That hormonal influence has an important bearing on cancer is well established for mice and men. Castration decreases the susceptibility of certain strains of mice to cancer of the breast. Yet in other mice, the adrenal appears to substitute for the missing ovary, to the extent that susceptibility to breast cancer continues. Here, then, is a difference in response to a hormonal behavior which is genetically linked. Similarly, castration in the male, when done before sexual maturity, means failure of development of secondary sex characters. The prostate fails to develop, and as the work of Huggins at the University of Chicago has shown, castration causes regression of cancer of the prostate, even though that improvement holds usually only for a period varying from one to two or more years. Moreover, the administration of the female sex hormone, estrogen, will often effect the same re-

sponse. Interestingly enough, when there is clinical evidence of cessation of response to the treatment, switching about and adding estrogen administration to castration or vice versa not infrequently affords the patient another free interval. In late cases of cancer of the breast, it has been found that administration of either estrogen or androgens may be accompanied by disappearance of the tumor and free intervals of varying length. Moreover, there is ample evidence to suggest that carcinogens and sex hormones are chemically related compounds which characterization is shared also by the adrenal cortex. Further the sex hormones and adrenals are probably not the only naturally occurring carcinogens within the body. Methylcholanthrene and the bile acids secreted in bile have somewhat similar structural formulas.

The overall mortality from cancer in Norway is much the same as in the United States. And yet in Norway the mortality from cancer of the gastro-intestinal tract is so much higher — greater than any place in the world save Japan. Is this an environmental circumstance? Are there carcinogens in the diet of Scandinavians and particularly Norwegians and Japanese? Or is it a lack of something in their diets which favors the development of cancer? Or a combination of genetic susceptibility, ingestion of carcinogens and lack of essential protective elements in the diet? Experimental evidence suggests that, for the mouse, vitamin A deficiency and the ingestion of reheated fat, employed for cooking, favor the development of precursors of gastric cancer as well as actual malignancies. It may even be that the ingestion of oils, such as mineral oil which interferes with the absorption of vitamin A, may make some contribution to the development of alimentary tract malignancies. Moreover, it has been shown by Ahlborn in Sweden (1936) that women with iron-deficient anemias (sideropenia) accompanied by dysphagia are very prone to develop cancer of mouth, pharynx or upper esophagus.

One reason it is so difficult to identify the significance of likely causative external agents with certainty is the long lag interval. In regard to the milk factor in susceptible mice, this interval averages ten months with a total life expectancy of approximately two years. The lag interval is probably correspondingly long in the longer life span of man. The fact that such differences occur in the site of malignant tumors among various peoples should encourage the belief that environmental circumstances do influence significantly the development of cancer. This variation in geographic distribution of cancer among different peoples merits careful study. Occupational cancers such as cancer of the urinary bladder of aniline dye workers and lung cancers among miners where radio-active ore is being mined lend further proof to the suggestion that environmental influences play an important role in the genesis of cancer.

It has been admitted that the nature of organ or tissue susceptibility to cancer is unknown; that the occurrence of cancer may represent an internal drive seeking expression; that many persons carry latent tissue susceptibilities, for one or more kinds of cancer which may or may not attain complete development. If we could have complete protection against the development of cancer in one of such organs, would the susceptibility for cancer development be increased in other organs? Bittner (1947) has shown that elimination of the milk factor in certain strains of mice does not protect them from lung cancer. Moreover, it would be interesting to know whether early excision of the breasts in susceptible mice getting the milk factor would be followed by the development of some other type of tumor.

If cancer experts were asked the following hypothetical question they would by no means give a uniform type of reply, for facts are not available to answer the question with finality. The question: If there were a fairly large group of women who had lost both breasts and uterus for whatever reason and not because of cancer, would there be an increase in other malignancies in this group? This inquiry in cancer biology has obviously more than an academic interest.

Support of Research

I enjoy the privilege of sitting in on the deliberations of committees authorized to expend public monies for cancer research. Liberal grants have been given to men in this and other areas of our country for the support of projects which appear to have merit. Yet a need which is equally great in all areas where cancer research is being done is for facilities in which to do the research. Every community must make its own contribution toward the erection of buildings which lend momentum to cancer research. In this respect, the Memorial Hospital in New York shows the happy result when the challenging practical aspects of the cancer problem in the patient and an active staff engaged in both clinical and experimental research are united under one roof. A similar enterprise has gotten under way at Bethesda, Maryland, under Federal auspices, although in a somewhat different manner—the research interest having preceded the clinical development. At Yale, the Universities of Chicago, California and Wisconsin, as well as in other places in this country, research groups are concentrating on cancer.

In this area a small but notable beginning was made in 1925 when the Citizens Aid Society under the leadership of Mrs. George Chase Christian built and equipped the present Cancer Institute of the University of Minnesota. That generous gift stimulated considerable interest in research in cancer, until at the present time, it constitutes one of the important occupations of many departments of the School of Medicine of this University. The Minnesota Division of the American Cancer Society has generously proposed to supplement the needs of the present cancer research at the University of Minnesota by pledging an additional $250,000 for facilities in the new Mayo Memorial. Yet, if the cancer research in this area is to be lent the full force that it could have, even more monies must be forthcoming.

Reading the minutes of the Congressional committee charged with hearing the testimony (1946) concerning an effective program of cancer research, it is difficult to escape the impression that the disposition of the committee was to grant a considerably larger sum of money than was asked. Yet listening to committees of scientists whose function it is to find and support worthy projects, one encounters a disposition to be conservative in spending. In other words, your stewards are anxious lest, in expending the taxpayer's money, *they* build up premature hopes of an early solution to this dread affliction. This attitude of conservatism in the committees indicates that it is new and original ideas that are wanted. Facilities, equipment, and labor are not the equal of new ideas or original techniques, but money and effort expended during the long intervals between the appearance of such ideas will lend real impetus to solving the problem.

Summary

Cancer is truly a dangerous enemy. In 1944, more than 170,000 persons died of cancer in this country; in 1946, 182,000. It is predicted that by 1950, its annual death toll will be 200,000 lives—a fifth of a million people, more than half of all American military losses in World War II.

Early recognition is the best means known today, to immobilize this enemy. Non-resistance is fatal and demoralizing to both sufferers and observers. Cancer is a local disease, even though silent for long periods of time; in that phase it *is* curable. A large scale exploration of techniques permitting earlier and easier detection appears to be in order until a simple, reliable biologic test is available. Cancer prevention and effective chemotherapeutic agents will be forthcoming only when we know considerably more about the biology of cancer.

Research is the promise of the future. When the nature of cancer is better understood, the mapping of plans for treatment and prevention will have far more intelligent direction than now. Coordinated research in the many interphases of the cancer problem will quicken progress by bringing new facts to light. More clinicians must enter cancer research mindful that data derived from studies upon man will never present that force of finality obtainable in better controlled experiments upon mice. They must look for smaller, statistically important differences which will help untangle the confusing interrelationships between genetic, hormonal and environmental influences in cancer genesis.

One need not be euphoric to suggest that research in this field holds as much promise of reward as does that in the field of vascular degenerative diseases. Solution of the cancer problem would give promise of longer useful life to a large number of people. Our outlook upon the problem must relate to persons now alive as well as to generations yet unborn.

NEW COMPOUND MADE TO FIND CANCER AND MUSCLE CHEMICALS

Creation of a new kind of substance for finding chemicals involved in cancer and other chemicals basically responsible for muscle movement was announced on September 10 by Dr. H. S. Bennett of the University of Washington Medical School.

The new substance is a chemical compound that contains mercury. When it combines with a special type of sulfur-containing compound, it signals the sulfur compound's location in red so that the scientist can see where the sulfur is. The particular sulfur chemicals located are ones containing a combination of sulfur and hydrogen known as sulfhydryl. The sulfhydryl combination is important both in muscle functioning and in cancer chemistry.

The new mercury red-signal compound is believed the first chemical ever created to let scientists trace body chemicals by sight. Radioactive chemicals used as tracers or tags for body chemicals signal either by the sound of the Geiger counter or by taking their own picture on an X-ray plate which then must be correlated with the optical picture of the tissue under study.

Carcinoma of the Lung*

Bronchial Secretion Studies in Early Diagnosis

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Early recognition of carcinoma of the lung has not paralleled the surgical treatment. There appears to be an increased incidence of bronchogenic carcinoma and it is now a frequently encountered malignancy, second in males only to carcinoma of the stomach.

That the present results of treatment leave much to be desired is emphasized in a recent report by Ochsner[1] where it is shown that out of every twenty-five cases of carcinoma of the lung only nine are suitable for pulmonary resection and of these nine only two will survive five or more years. These same results are duplicated in other clinics. However, Ochsner did show that when the growth was limited to the lung at the time of surgery the survival rate was 42.8 per cent at the end of five years. These figures emphasize the imperative need of earlier diagnosis. The cytologic examination of bronchial secretions is a measure helpful in meeting this requirement. Before discussing the indications for, and technique used in examining these secretions, the symptoms and present diagnostic agents should be reviewed.

Carcinoma of the lung is predominantly a disease of males in the ratio of 9:1. Cough is the most frequent early symptom in 90 per cent of cases. The sputum raised is usually scant, increasing in amount as bronchial obstruction progresses. Chest pain occurs in 60 to 70 per cent. This pain may be mild but often the patient alone can localize the lesion by a sensation of pain deep in the chest. Hemoptysis varying from a few streaks to several ounces of blood occurs in 60 per cent of cases. Such bleeding should be considered the result of an intrabronchial growth unless x-ray and sputum examinations are positively those of bronchiectasis or tuberculosis. Half of the cases present histories of previous respiratory tract infections. The diagnosis of a virus or unresolved pneumonia in a male over 40 years is hazardous until carcinoma of the lung is excluded. Unilateral wheeze is of definite diagnostic significance because it is usually the result of some degree of bronchial obstruction.

There is no one symptom characteristic of lung carcinoma. It masquerades as one of the more common lung disorders. Valuable time must not be wasted through erroneous diagnoses of unresolved pneumonia, lung abscess, bronchiectasis, heart disease, and asthma.

In the diagnosis the roentgenogram of the chest will show an abnormal shadow in almost every instance of lung carcinoma, but it will not make a positive diagnosis. The shadows cast demand active investigation. Second to the chest x-ray in establishing a diagnosis is bronchoscopy. The direct inspection of the bronchial tree gives valuable information and in bronchiogenic carcinoma a positive tissue biopsy can be obtained at most in only 60 per cent of the cases. It must be remembered that in one-half of the cases the growth is in either upper left or upper right lobe, making access to the lesion virtually impossible. It is in the attempt to increase the percentage of positive diagnosis prior to surgery that cytologic examination of bronchial secretions has appeared as a distinct advance. This procedure was described by Dudgoen and Wrigley [2] of England in 1935, but to Papanicolaou[3] goes a great deal of credit for placing the cell smear method of diagnosing cancer on a sound basis.

In preparing sputum smears a freshly expectorated specimen from the bronchi is collected in 95 per cent alcohol, with the patient previously instructed to collect only that sputum raised from the lower respiratory tract. The best specimen is usually obtained in the morning. This specimen is smeared on a glass slide, fixed with alcohol and ether, and then stained with hematoxylin and eosin. When a bronchoscopy is performed the technique differs in that specimens are obtained from the right and left main stem bronchi using separate aspirating tips in each instance. Then the bronchus of the lobe harboring the lesion under suspicion is lavaged with 2 to 5 cc. of normal saline while the patient is rotated to that side; the lavaged material is then aspirated as a single specimen. Bronchial secretions collected in this way are then centrifuged. The material thus thrown down is smeared on slides and processed exactly as sputa smears. Five slides are made of each specimen. Prepared slides are then screened by a technician trained in cytology. Slides showing suspicious malignant cells are examined by our pathologist, Dr. John LeMar. No slide is reported negative until after a twenty-minute search has been made. The method is time-consuming and requires one trained in this procedure, the percentage of positive results increasing with the experience of the cytologist.

The general characteristics of cancer cells in bronchial secretions are scant cytoplasm and the nuclei are large in proportion to the cytoplasm. Recognition of the tumor cell is by nuclear changes. The nucleus is hyperchromatic, its border sharp appearing almost like a retouched photograph. The nucleoli are large, often multiple and prominent. Mitotic figures are rarely encountered as these are cells sloughed from the surface of the tumor and are not from the active growth center. There is close correlation between the cells of the smear and those of the tissue specimen from the same patient.

*Read at the North Dakota State Medical Association meeting at Minot, North Dakota, May 16, 1949.

†From the Fargo Clinic, Fargo, North Dakota.

The results of various workers in this field are rather uniform. Gibbon, et al,[4] report a positive preoperative diagnosis of bronchiogenic carcinoma in 90 per cent of cases. Thirty-six per cent of these cases were negative to bronchoscopic examination and positive diagnosis was made on cytology of bronchial secretions. Liebow, et al,[5] report a 48 per cent increase in preoperative diagnosis over bronchoscopic biopsies.

The following case presentations illustrate the points emphasized in this paper:

Case 1, No. 86494. A 46-year-old white female was first seen complaining of generalized aching in her joints,

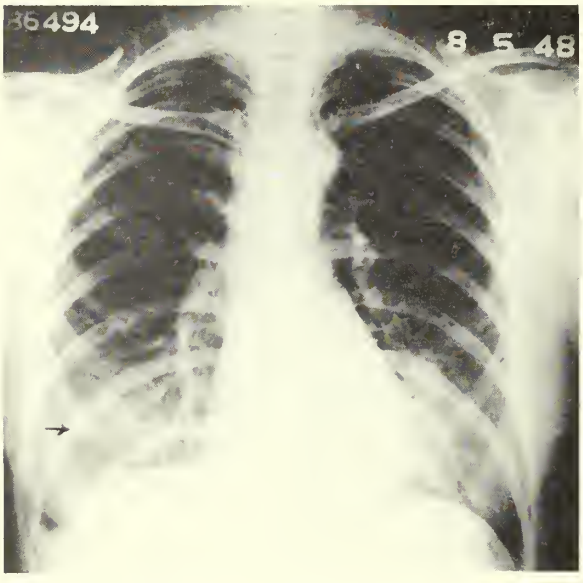


Fig. 1. Chest x-ray Case 1 showing small area (arrow) pneumonitis right middle lobe.

a nocturnal cough productive of mucopurulent sputum, and some dyspnea on climbing stairs. Past history was negative. Family history revealed one paternal grandmother died of carcinoma, site unknown. Physical examination was essentially negative. A chest x-ray taken at this time showed a slight patchy infiltration in the right lower lung field (Fig. 1). Sputum specimens were obtained and the second specimen was reported positive for neoplastic cells (Fig. 2). Subsequent bronchoscopy revealed an entirely normal tracheobronchial tree but bronchial secretions obtained from the right middle lobe bronchus were reported positive for neoplastic cells. On the basis of this evidence, the patient was prepared for surgery and an exploratory thoracotomy was performed on the right side through the bed of the fifth rib. Upon examining the right lung I was impressed by one thing; namely, the absence of positive findings, a direct contrast to previous experience in carcinoma of the lung. There was a slight feeling of induration toward the periphery of the middle lobe on its inferior surface. With the evidence of two positive smears, one being from the right middle lobe, a total right pneumonectomy

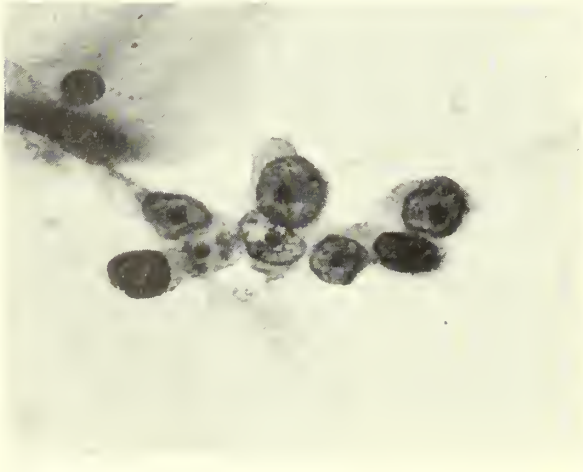


Fig. 2. Group of tumor cells from sputum Case 1. Note prominent nucleoli.



Fig. 3. Right lung removed at operation Case 1. Lower arrow points to site of undifferentiated bronchiogenic carcinoma middle lobe, upper arrow to lymph node producing bronchial compression and secondary bronchiectasis.

was then carried out. There was no hilar lymph node involvement. The patient withstood surgery well and the postoperative course was uneventful. The pathologist's report on the surgical specimen was "specimen consists of the entire right lung (Fig. 3). A nodule measuring 2x1x0.5 cm. is present beneath the pleura of the middle lobe on the lateral inferior surface. Microscopic examination of this nodule (Fig. 4) shows an undifferentiated carcinoma infiltrating between groups of alveoli. Sections of hilar lymph nodes are negative. Diagnosis: Carcinoma, undifferentiated type, right middle lobe." The patient returned to an active life three weeks after surgery. Figure 5 shows her chest x-ray seven months following surgery. It would seem that the chances of this patient having a permanent cure of her bronchio-

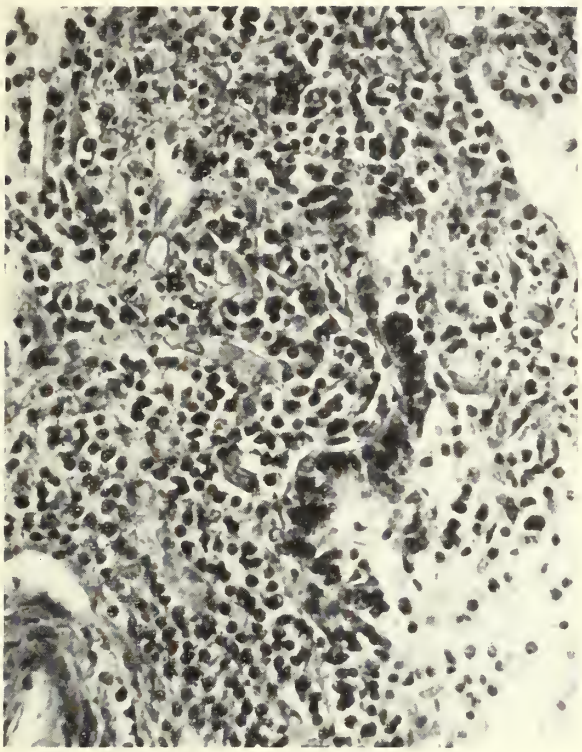


Fig. 4. Microscopic appearance undifferentiated bronchiogenic carcinoma Case 1.

genic carcinoma were excellent despite the fact that this was of the undifferentiated type.

Case 2, No. 64976. A 64-year-old white male developed chills, temperature 103°, cough, and pain in the left upper chest. He was given 300,000 units of one of the longer acting penicillin preparations by his referring physician and in twenty-four hours was afebrile, but a productive cough persisted. X-rays at this time showed

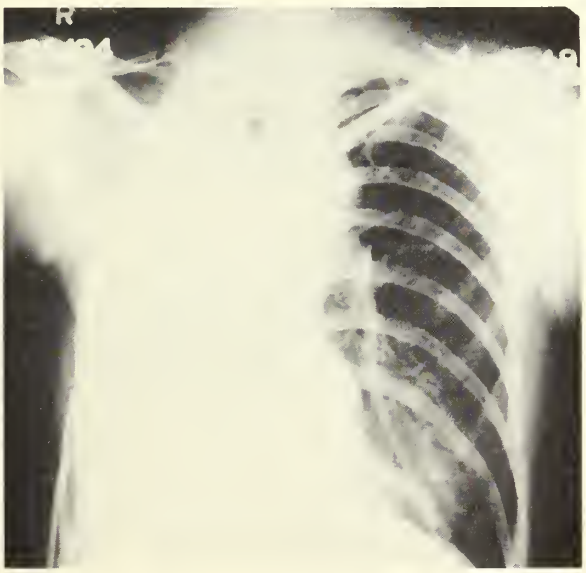


Fig. 5. Case 1, seven months after right pneumonectomy.



Fig. 6. Case 2 showing a persisting left upper lobe pneumonitis secondary to squamous cell bronchiogenic carcinoma.

a pneumonitis of the left upper lobe. X-rays taken ten days later, when the patient was referred for further study, showed a persistence of the pneumonitis in the left upper lobe (Fig. 6). Sputum was negative for neoplastic cells. On the basis of roentgenograms a bronchoscopy was done, with findings negative except for edema at the orifice of the left upper lobe bronchus. There was nothing present for biopsy. Bronchial secretions from

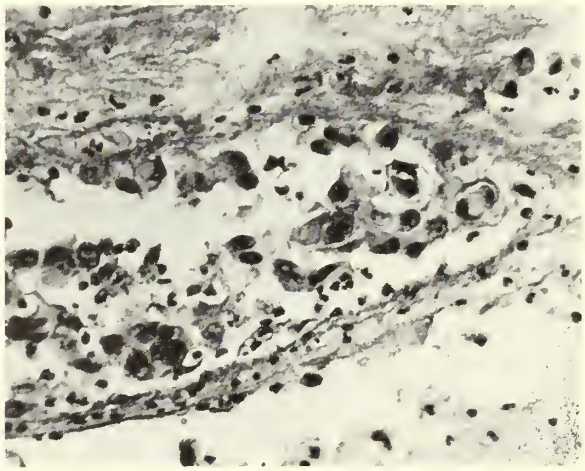


Fig. 7. Bronchial secretion tumor cells Case 2. Squamous cell carcinoma.

the left upper lobe showed squamous cell carcinoma (Fig. 7). This case illustrates the previously emphasized point of a persisting pneumonitis in a male over 40, the frequently negative bronchoscopic findings in an upper lobe lesion, and the fact that a higher percentage of positive cytologic studies will be obtained from bronchial aspirations than from sputa studies.

Comments and Conclusion

Diagnostic methods, until recently, have not kept pace with the surgical treatment of bronchiogenic carcinoma. Now cytologic examination of bronchial secretions is an established reliable means of diagnosing lung cancer. It does not replace already proven diagnostic measures but is an adjunct that can increase to 90 per cent the percentage of preoperative diagnosis, thus enabling the thoracic surgeon to proceed more confidently with radical surgery. Future statistics as to five-year survivals following pneumonectomy should reveal decided increase through this method of earlier diagnosis.

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FUNDS GIVEN FOR CANCER RESEARCH

The Federal Security Administration has announced Public Health Service grants totaling $3,250,000 to assist in the construction of cancer research facilities at nine institutions.

The grants were made by the National Cancer Institute of the National Institutes of Health, Research Branch of the Public Health Service upon recommendation of the National Advisory Cancer Council, and approved by Surgeon General Leonard A. Scheele of the Public Health Service.

All the construction grants were made to institutions with a strong affiliation to medical schools, Dr. Scheele pointed out. "These grants will tend to strengthen the medical schools, by forging a closer link between medical research and medical education. Our chief aim in making the grants is to further cancer research by helping provide more adequate facilities for cancer investigators, but the strengthening of medical education, especially in regard to the cancer training of future physicians, is an important by-product."

"The Federal grants permit additions to existing structures, or supplement funds contributed by the institutions themselves or by outside donors."

UNIVERSITY OF MINNESOTA GRANT

At the University of Minnesota, Minneapolis, Dr. Harold S. Diehl announced its portion, a grant of $200,000 for two floors of clinical research at the Mayo Memorial Medical Center now being built to house medical research at the University.

Ray Amberg, director of University of Minnesota Hospitals, said the university soon will ask for bids on preparation of the site—expected to come to some $150,000. The site will be the now-open space facing the University hospitals. There is a possibility that the tower at the Center may go as high as 22 stories. Foundations will be built to carry that high a structure, and the university will seek alternate bids for from 18 to 22 floors.

Cytologic Diagnosis of Carcinoma*

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The rationale for the examination of secretions as a diagnostic method is based upon the desquamation of carcinoma cells from malignant tumors having a free surface. Carcinoma cells may be collected and stained by appropriate methods in whatever medium they occur, sputum, vaginal secretions, or urine. The cells are then recognized by certain atypical characteristics which they possess, including large size, variation in size and shape, hyperchromasia of the nucleus, and the presence of large nucleoli (Figs. 1 and 2). Occasionally, one finds actual pieces of tumor tissue in the secretion.

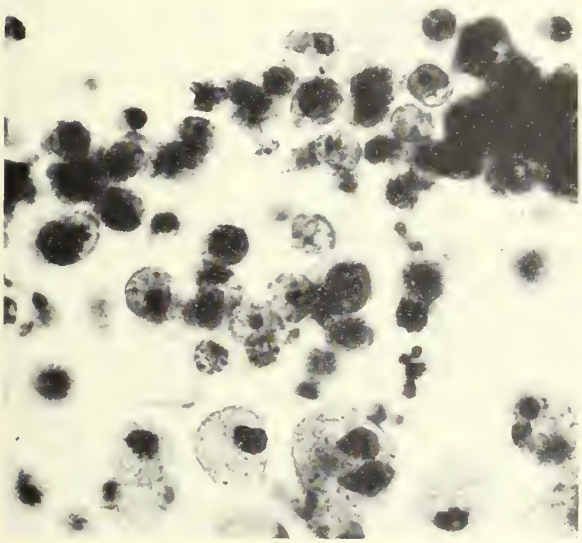


Fig. 1. Carcinoma cells in sputum. The nuclei are small but there are prominent nucleoli (hematoxylin and eosin stain; x 750).

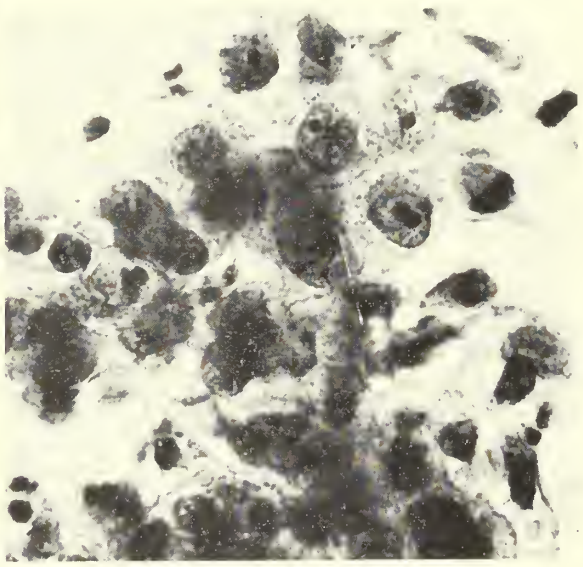


Fig. 2. Carcinoma cells in sputum. The cells are larger than those in figure 1 and the nucleoli are very prominent (hematoxylin and eosin stain; x 750).

Carcinoma of the Uterus

The use of vaginal smears in the diagnosis of carcinoma was first reported by Papanicolaou [1,2] in 1928. In 1943, Papanicolaou and Traut [3] reported that microscopic examination of vaginal smears failed to disclose carcinoma cells in 3.2 per cent of 127 cases of carcinoma of the cervix. They also said that this diagnostic method failed to disclose carcinoma cells in 9.3 per cent of 53 cases of primary carcinoma of the uterine fundus. Fremont-Smith, Graham and Meigs [4] reported that a falsely positive diagnosis of carcinoma was made on the basis of examination of vaginal smears in 55 (1.6 per cent) of 3,327 cases in which carcinoma was not present. In general, examination of vaginal smears has been found to be a more accurate diagnostic method in cases of carcinoma of the cervix than it has been in cases of carcinoma of the fundus. Essentially similar findings have been reported by Ayre [5] and by Jones, Neustaedter and Mackenzie.[6]

Microscopic examination of vaginal smears is most useful in the diagnosis of pre-invasive carcinoma, or carcinoma in situ. The gross appearance of this lesion usually is not typical. At present, it is impossible to say how frequently carcinoma in situ of the cervix leads to the development of infiltrative carcinoma and how much time elapses before this transition occurs. The literature, however, contains reports of cases which suggest that this lesion occasionally leads to the development of infiltrative carcinoma. It is not known whether or not carcinoma in situ is reversible in certain instances. Fremont-Smith, Graham and Meigs [7] reported that this diagnostic method disclosed carcinoma cells in 15 of 17 cases of carcinoma in situ of the cervix. An attempt was made to obtain a specimen for biopsy in 13 of the 17 cases. In 1 of the 13 cases, a specimen could not be obtained; in another case, the specimen was inadequate and an attempt was not made to obtain another speci-

*Read at the North Dakota State Medical Association meeting at Minot, North Dakota, May 16, 1949.

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men. In 5 of the remaining cases, microscopic examination disclosed carcinoma in situ. In 1 of the 5 cases, the first specimen was inadequate and it was necessary to obtain another specimen. Foote and Stewart [8] made a study of the site of the lesion in 27 cases of carcinoma in situ of the cervix. They concluded that a positive diagnosis of carcinoma could have been made in 25 of the 27 cases if a specimen for biopsy had been removed from the central junctional area of both the anterior and posterior lips of the cervix and from the lateral angles of the internal os in all of the 27 cases. It seems reasonable to assume that microscopic examination of vaginal or cervical smears will result in a more widespread sampling of the cervical mucosa than will similar examination of a single specimen which has been removed for biopsy. The incidence of carcinoma in situ of the cervix is more common than has been appreciated. Pund and Auerbach [9] found that this lesion was present in 3.9 per cent of 1,200 cervices which had been removed by hysterectomy for pathologic conditions other than carcinoma.

Some authors have maintained that examination of vaginal or cervical smears could be applied profitably to the screening of the female population at large in order to detect carcinoma of the cervix in its early stages. Foote and Li [10] have pointed out some practical objections to the use of this diagnostic method in such a program. Assuming that carcinoma of the cervix affects 1 of every 1,500 women who are more than 35 years of age and that it is necessary to examine 2 smears for each woman, 3,000 smears would have to be examined in order to detect a single instance of carcinoma. The microscopic examination of these smears would require at least five hundred hours, or approximately 20 per cent of a normal working year of three hundred working days of eight hours each. It is obvious that a pathologist could not afford to spend so much time examining normal smears. It has been shown, however, that technicians can be trained to screen out smears which do not contain any carcinoma cells. It is possible that this will be the solution to the economic phase of the problem.

Carcinoma of the Lung

The practical application of cytologic examination of sputum was first shown by Dudgeon and Wrigley [11] in 1935. They were able to detect carcinoma cells in sputum in 68 per cent of 58 cases of proved carcinoma of the lungs or respiratory tract. Herbut and Clerf [12] have utilized bronchial secretions and washings, as obtained by the bronchoscopist, for cytologic examination. They have expressed the opinion that the examination of sputum is time-consuming and that the results of such examinations are too inaccurate to be worth while. In our laboratory at the Mayo Clinic, a diagnosis of carcinoma of the lung has been made by means of cytologic examination of both sputum and bronchial secretions.[13-17] The smears are fixed in ethyl alcohol and stained with hematoxylin and eosin. It is our feeling that the experience of the person who is examining the smears is more important than the type of stain that is used. In examining sputum, we have prepared 5 smears of each specimen of sputum and have attempted to obtain 3 specimens of sputum in each case.

Although smears are easier to prepare from fresh sputum than from sputum that has been collected in 95 per cent ethyl alcohol, the collection of sputum in ethyl alcohol has many advantages. One of these is that the time that elapses between the collection of the sputum and the preparation of the smear is not important. In cases in which roentgenographic examination reveals evidence of an intrathoracic lesion, we examine smears of sputum routinely for carcinoma cells provided the patients can produce sputum. The results which we have obtained with this diagnostic procedure have been reported previously. The advantages of using sputum instead of bronchial secretions are obvious. Since sputum is easy to obtain, multiple specimens can be examined without causing the patient any discomfort. On the other hand, examination of the sputum has certain disadvantages. It takes longer than the examination of bronchial secretions or washings. In our experience, examination of smears of sputum or bronchial secretions has resulted in a striking increase in the number of cases in which a preoperative diagnosis of pulmonary neoplasm has been made. In general, it will disclose carcinoma cells in approximately 70 per cent of cases of bronchogenic carcinoma whereas biopsy will reveal a malignant lesion in about 40 per cent of such cases.

In from 1 to 2 per cent of cases in which examination of smears of sputum has appeared to disclose carcinoma cells, the resulting diagnosis of carcinoma of the lung has proved to be erroneous. This percentage of error is low enough to be accepted by clinicians and surgeons. The method is of no value in the diagnosis of adenoma of the lung. It is only of limited value in the diagnosis of metastatic tumors of the lung because such tumors frequently do not produce any ulceration of the bronchial mucosa. It is of value, however, in the diagnosis of alveolar cell tumors.

Cytologic examination of sputum or bronchial secretions is especially useful in the diagnosis of carcinomas of the upper lobe which are beyond reach of the bronchoscope. It likewise is useful in cases in which a carcinoma is situated at the periphery of either lung. It is interesting to note that this method may disclose carcinoma cells in cases of such inaccessible neoplasms as superior sulcus tumors.

Carcinoma of the Urinary Tract

If cytologic examination of urinary smears is to be of value in the diagnosis of carcinoma of the urinary tract, it is our opinion that it must be fairly accurate in disclosing carcinoma cells in cases of carcinoma of the kidney, particularly in cases of carcinoma of the renal cortex or hypernephroma. Its value in cases of carcinoma of the bladder is limited because the bladder can be visualized easily with the cystoscope. On the other hand, the kidney cannot be examined visually except at open operation or after nephrectomy. In our

experience, examination of urinary smears has disclosed carcinoma cells in approximately 50 per cent of cases of hypernephroma. On the other hand, in more than 10 per cent of cases in which this method has appeared to disclose carcinoma cells, the resulting diagnosis of a malignant lesion has proved to be erroneous. Since this figure is too high to make the use of the method practicable, we have almost abandoned its use in the diagnosis of carcinoma of the kidney.

The diagnosis of occult carcinoma of the prostate is a difficult problem. A preliminary investigation has disclosed that examination of prostatic smears obtained after prostatic massage is a fairly accurate method of making the diagnosis of carcinoma of the prostate. In such smears one can actually find clumps of tumor tissue. The clusters of cells differ from other forms of exfoliated cells in that the cells are forcibly broken off. This method, however, will need more careful evaluation before its final role in the diagnosis of carcinoma of the prostate can be determined.

Carcinoma of the Stomach

There has been considerable difficulty in obtaining satisfactory material for cytologic examination in cases of carcinoma of the stomach. The main difficulty lies with the enzymes of the stomach, which very quickly destroy nuclear detail of exfoliated cells. In the main, two types of material have been used for cytologic examination in cases in which the presence of carcinoma of the stomach is suspected: (1) gastric contents which are obtained by aspiration after the patient has fasted for at least twelve hours, and (2) gastric washings which are obtained by washing the stomach with isotonic sodium chloride solution after the gastric contents have been evacuated. In our experience, cytologic examination of the gastric contents or gastric washings has proved to be an accurate method for detecting the presence of carcinoma of the stomach but the number of cases in which it has resulted in an erroneous diagnosis of carcinoma has been higher than desirable.

In cases of carcinoma of the lower end of the esophagus or of the cardia of the stomach, cytologic examinations of smears of material obtained by the esophagoscopist by direct vision frequently will disclose carcinoma cells. This method of diagnosis is particularly valuable in such cases because it is difficult to obtain specimens for biopsy. In our experience, the use of this method has resulted in a diagnosis of carcinoma of the lower end of the esophagus or of the cardia of the stomach in approximately 100 cases. The diagnosis of carcinoma subsequently was proved to be erroneous in only 3 of these cases. In each of these 3 cases, the lesion proved to be a benign ulcer which was situated at the cardioesophageal juncture.

Summary

Cytologic examination of body secretions is a time-consuming task which requires considerable experience. It also is an expensive procedure. We have found that this method of examination is most useful in the diagnosis of bronchogenic carcinoma. It is of little value in the diagnosis of carcinoma of the urinary tract. It is of definite value in the diagnosis of carcinoma of the cervix. In cases of carcinoma of the stomach, esophagus or prostate, it must be evaluated further before definite statements can be made.

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Carcinoma of the Larynx*

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BECAUSE the cure of a carcinoma so often implies sacrifice of function, carcinoma of the larynx is viewed with dread by doctor and patient. Actually laryngeal carcinoma is a most favorable malignancy when it is confined within the laryngeal box. Early diagnosis coupled with adequate therapy can, for example, in a mid-cord lesion of small size, promise a 93 per cent five-year cure rate.

Forty per cent of laryngeal carcinoma occurs in the decade from 50 to 60 years of age. The spread, however, is from age 10 to 90 years. It is predominantly, but not exclusively, a disease of males. The etiology is as obscure as it is in most carcinoma.

For purposes of discussion it is important that lesions within the larynx be differentiated from those involving the extrinsic aspects of the larynx.

To be truly intrinsic a lesion must be cordal with infiltration confined between the verticular band and immediate subglottic area. The early symptom is hoarseness. Approximately 90 per cent originate on or near the free, phonating margin of the cord. A change in voice is inevitable, and in a social world one can ask for no more expressive and apparent symptom. Hoarseness demands an adequate laryngeal view. False assurance and palliative piddling expend valuable time and are reflected in rapid decline in curability rate.

Intrinsic laryngeal malignancy tends to be of grade one or two malignancy of the squamous cell type. There is question as to the value of grading. Nevertheless, grade one and two may be accepted as having a better prognosis than grade three and four. The extension of the lesion plus the grade of malignancy is of more prognostic value than grade alone.

Surgery, radiation therapy, or combinations of the two are the usually accepted modes of treatment. Cody has recently made a signal contribution to therapy by assembling the figures in 25,000 cases reported over the last decades by otolaryngologists, general surgeons, and radiologists. Clarification in this manner is impartial and invaluable. Few medical men are blessed with the longevity and tumor volume necessary to formulate opinions as sound as those accumulated from many sources of diverse viewpoint.

Intralaryngeal surgery through one of several direct endoscopic approaches to the larynx has a very limited place in treatment of laryngeal carcinoma. A 5 millimeter midcord lesion treated adequately in this manner can expect a 93 per cent cure rate.

Midline or near-midline division of the thyroid cartilage through a central neck approach, so-called laryngofissure, gives clear access to the larynx and permits excision of lesions of one cord showing good mobility without involvement of artenoid posteriorly or commissure anteriorly. Those lesions reaching within millimeters of the anterior end of the cord at the commissure should be approached by the modified, so-called commissure, technique to the normal side of midline. Lesions which cross the anterior commissure to the opposite cord in any degree should not be condemned to a conservative laryngofissure, but should have laryngectomy. Adherence to these principles can produce a five-year cure rate of 76 per cent in lesions of laryngofissure extent. Postoperative death from laryngofissure is but 2 per cent. Irradiation in this type of case offers a cure rate of 67 per cent. Irradiation has a greater morbidity and is attended by more complications.

Intrinsic laryngeal carcinoma of wider extent than the select cases above require a total laryngectomy. It offers a five-year cure rate of 60 per cent. If cervical nodes are already involved metastatically and are removed by block dissection the rate can still be 30 per cent. If, through unwise conservatism, one has performed an unsuccessful fissure, the follow-up total laryngectomy can provide a five-year cure in only 39 per cent, as compared with 60 per cent as a first procedure, while irradiation can provide a 35 per cent cure rate. If cervical nodes appear after a total laryngectomy, a block dissection can offer a 40 per cent five-year cure.

If one is moved to select irradiation as a mode of therapy for a case which would be amenable to total laryngectomy, resection of the laryngeal cartilages to avoid the continuing misery of perichondritis is a recognized first step. Irradiation after cartilage resection can offer a five-year cure rate of 38 per cent as compared with 60 per cent for total laryngectomy. Irradiation as salvage therapy for operated cases is of real value and can salvage 30 per cent of cases with recurrence. As a palliative measure in extensive inoperable cases, irradiation is inadmissible. It increases suffering and shortens life.

Extrinsic laryngeal carcinoma originates outside the glottic larynx and tends most frequently to appear on the epiglottis and on the posterior aspect of the cricoid ring. Symptoms appear late. Pain, often referred through tenth nerve pathways to the ipsilateral ear, and obstructive dysphagia are most common. The lesion may be well advanced at the time of first complaint. There is no substitute for a thorough mirror examination of all hypopharyngeal complaints. Many are functional but one cannot differentiate from the far side of a consultation desk. Extrinsic lesions tend to be of grade two and three

*Read at the North Dakota State Medical Association meeting at Minot, North Dakota, May 16, 1949.

malignancy and for this reason they are sometimes spoken of as "radio sensitive." One should not confuse radio sensitivity with radio curability, as they are not synonymous.

Free-margin epiglottic lesions can be completely removed with surgical diathermy with a suspension laryngoscopic exposure. The prognosis will be good. If the lesion has extended to the tongue base, its destruction with cautery and implantation of the base with radon seeds can give a cure rate of less than 50 per cent.

Post-cricoid lesions have the least favorable outlook of all laryngeal lesions. Radio curability approximates nil. Progressive dysphagia, eventual gastrostomy, laryngeal extension, or inferior laryngeal nerve invasion with paralysis, and eventual tracheotomy form a succession of tragic preludes to death. Laryngectomy combined with pharyngectomy and upper esophagectomy is indicated if extensions and fixation do not prevent. A large cervical skin flap can be utilized to join hypopharynx to esophagus and is closed in tube-like pharyngeal fashion at a second procedure in several weeks.

Partial laryngeal removal through intralaryngeal or laryngofissure approach impairs laryngeal function but does not destroy it. The patient retains a hoarse but useful voice. Total laryngectomy brings the breathing stoma of the trachea to a permanent position at the base of the neck anteriorly and leaves no natural phonatory mechanism. Artificial voice production through a reed-like attachment to the tracheal stoma has many disadvantages including the handling of a conspicuous and messy mechanical device and the duck-like quality of the resultant speech. Phonation with an electric buzzer plate applied near the hyoid area has also the nuisance of device and batteries and the production of an abnormal tone. Eructation of small amounts of air aspirated into the esophagus can, on the other hand, produce a tone of amazing clarity which can be molded into speech in the normal manner. Esophageal speech produced in this way is an adequate substitute for laryngeal speech and is a skill within the power of the average individual to develop to a fine degree. It removes much of the disability which formerly was the penalty incurred in laryngeal surgery.

To all who deal with malignant disease frustrations and defeat are commonplace. One too often labors diligently in surgery for hours and struggles with a patient through a difficult and trying postoperative period—and then confronts a recurrence, local or metastatic, when all had seemed to be going so well. It must occur to all of us in our present-day handling of malignant disease that we are cutting down the tree by whittling it away a twig at a time. Until better methods are brought forward we must continue to whittle, because it is better to attack a problem in an unsatisfactory manner than not to attack it at all. It is to be hoped that the bulk of funds from our national cancer campaigns will continue to be spent at the trunk of the problem and not be frittered away in popular magazine assaults on imaginary mitotic figures.

Summary

1. Laryngeal carcinoma appears in the practice of the average physician at some time in his career.

2. In the majority of cases the symptom of voice change appears early in the disease.

3. The prognosis for cure is exceptionally high for malignant disease.

4. The five-year cure rate declines rapidly with delay in diagnosis.

5. The proper method of treatment varies in the individual case and is reasonably well established on statistical grounds.

6. Loss of speech function is no longer an irremediable tragedy.

CORTISONE MAY HELP VICTIMS OF HAYFEVER

Cortisone, the new and famous though scarce remedy for rheumatoid arthritis, may point the way to better treatment for hayfever, asthma and other allergies. This suggestion comes from Dr. Louis Prickman of the Mayo Clinic where only four months ago Cortisone's value in rheumatoid arthritis was discovered.

Cortisone is not suggested directly as a remedy for allergies in Dr. Prickman's report. He sees its success in relieving arthritis symptoms as showing "a promising new direction for allergic research."

"Rheumatoid arthritis and allergic diseases," he points out, "have any number of features in common and the underlying mechanism may be the same."

The allergic reaction, whether it comes as hayfever, asthma, hives or a reaction to penicillin, is a defensive process, Dr. Prickman explains. It is a "warning on the part of nature" that the cells of the body have met a harmful substance.

Surgical Therapy for Duodenal Ulcer

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CONTROVERSY still continues about treatment of peptic ulcers of the duodenum. A generation ago the most lively discussions concerned the question of medical versus surgical management. At that time the surgeons were in almost complete agreement. With few exceptions they advocated and performed gastro-enterostomy or pyloroplasty, usually the former, as routine surgical procedures for chronic duodenal ulcer. The introduction of partial gastric resection for peptic ulcer cases in 1918 by Finsterer caused some controversy among the surgeons themselves over the operation of choice, but for longer than a decade this technique won relatively few converts in America. The time was near at hand, however, when practically all would abandon their time-honored preferment for gastro-enterostomy or pyloroplasty in favor of partial gastric resection. The explanation for this radical and quite universal switch in surgical procedure was found in the realization, after long years of observation, that gastro-enterostomy and pyloroplasty failed too often to help cure the ulcer whereas partial gastric resection gave promise of much better results.

The notable slowness of surgeons to employ partial gastric resection was also due to several other factors. In the first place it was found to be a much more difficult operation to perform than gastro-enterostomy. Serious misinformation about what constituted a satisfactory partial gastric resection prevailed for a long time. Dangerous and wholly unnecessary innovations increased greatly the already alarmingly high mortality and morbidity rates even in the best surgical clinics of this country. Teaching institutions had to learn the hard way that skill and experience count more for the success of this operation than they do for many other major abdominal procedures and that unusual care and supervision are necessary in training young surgeons in this field. About twenty years of trial and error with partial gastric resection were necessary before it achieved its present well-deserved place as a relatively safe and satisfactory operation when performed by a competent surgeon. In most places it has earned and enjoyed this status for less than a decade. Thus Dr. Henry F. Graham reported that the mortality of subtotal gastric resection at the Methodist Hospital in Brooklyn for both gastric and duodenal ulcer cases from 1936 to 1940 "was so high that I hate to mention it" and he didn't, but he did report that from January 1, 1940 to May, 1944 there had been only one death among 77 such operations performed there. The initial mortality rate at the University of Iowa was 28 per cent. McKittrick reported a mortality rate of 8.1 per cent for 124 duodenal ulcer cases at the Massachusetts General Hospital from 1936 through 1941 and he found in addition to this 27 major postoperative complications which endangered the life of the patient. According to his report, therefore, 37 or 30 per cent of this group of 124 duodenal ulcer cases subjected to subtotal gastrectomy either died or had some serious complication. On the other hand, during 1942 and 1943, 94 duodenal ulcer patients had subtotal resections at the Massachusetts General Hospital without a death and with very few complications. This data is quite typical of the remarkable improvement in mortality and morbidity rates for such operations in recent years in leading surgical clinics of this country.

Almost simultaneously with these notable achievements of subtotal gastrectomy has been the re-introduction of vagotomy as a preferable operation for these ulcer cases. So the controversy flares up anew over the question of how best to treat them surgically, and to add to this confusion gastro-enterostomy and pyloroplasty are again finding favor as adjuncts to vagotomy. Time will be required to settle a lot of the present-day conflicting claims and contentions. In the meantime we will be content at the Northwest Clinic to depend upon adequate subtotal gastric resection as the operation of choice for the 10 to 15 per cent of chronic duodenal ulcer cases which fail, for one reason or another, to obtain satisfactory results under medical management. We feel that our experience in a small series of cases together with our knowledge of the excellent results obtained in numerous leading surgical centers in this country amply justify our stand.

The primary purpose of this or any other operation or treatment for ulcer is, or should be, to curtail the corrosive action of gastric juice sufficiently to permit healing. Adequate gastric resection accomplishes this in several ways. Resection of two-thirds to three-fourths of the stomach removes a substantial and usually a sufficient mucosal area of acid-secreting cells. An adequate resection also eliminates completely the very potent gastrin-forming and acid-cell-stimulating antral glands which are found not only in the mucosa of the antrum itself but also along the lesser curvature of the stomach almost to the esophagus. A third important factor, no doubt attributable to the operation, is the dilution and neutralization of the remaining gastric juice by the content of the duodenum which now mixes more freely with it. Still another factor in ulcer healing is the isolation of the duodenal ulcer which is no longer subjected to the mechanical and chemical insults which it normally sustains.

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One of these several factors conducive to ulcer healing requires special consideration. I refer to the so-called antral cells and the necessity for their complete removal. Failure to accomplish this was an early mistake and no doubt continues to be one though much less frequently than formerly. Finsterer himself was largely responsible for this because of his so-called resection for occlusion in cases of difficult closure of the duodenal stump. Closure in these cases was accomplished by transecting the antrum and leaving part of it behind—mucosa and all—for easier and more secure suturing than that afforded by an unsatisfactory duodenal stump. Even though everyone now concedes the positive necessity of complete removal of the antral mucosa in every case failure to accomplish this is still a not infrequent error which is quite certain to cause serious trouble promptly.

The best way of insuring complete removal of all antral cells is to perform a partial gastric resection including all of the antrum and practically all of the lesser curvature. This is possible in most instances, but it is conceded that there are occasional cases in which closure of the duodenal stump is likely to present almost insurmountable technical difficulties if none but duodenal tissue is available for suturing. I have never encountered such a case and do not believe that they occur nearly as often as some surgeons report. However, in the presence of marked scarring, shortening of the first and second portions of the duodenum, and bewildering involvement of adjacent structures, an operation short of the ideal type finds favor in many places. A two-stage operation may be performed in which transection of the antrum is carried out in the first stage with sufficient amount of the distal segment left for closure. It is much easier and safer to remove this antral segement at a second operation after subsidence, in part at least, of the inflammatory reaction about the pylorus. It should be emphasized, however, that the second stage of the operation must follow the first after an interval of not more than a few weeks because of the great danger of early stomal ulceration due to the retained antral mucosa. Another procedure is a one-stage operation in which the antrum is transected and utilized for closure but only after removal of its mucosa. The latter may prove to be quite a bloody and otherwise uninviting procedure with a high incidence of incomplete removal of the mucosa.

All of this discussion about the technical difficulties encountered in and about the first and second portions of the duodenum shows that here is the most difficult part of most gastric resections for ulcer. The changes in the duodenal stump to be closed incident to ulceration and operative procedures give rise to these difficulties. Care in preserving all duodenal tissue possible for closure is of the greatest importance and is too often disregarded. As far as ultimate results are concerned, it does not matter whether the duodenal ulcer is cut through, cut out, or left entirely undisturbed. On the other hand, in regard to the immediate postoperative results, it is of greatest importance to preserve for closure every millimeter of duodenum possible with its blood supply intact regardless of whether it bears an ulcer or part of an ulcer. Avoidance of clamps will aid materially in this effort at conservation without the introduction of any objectionable features. Transection of the duodenum can then be done very accurately just beyond the pylorus without sacrificing any of it. If this planned division of the duodenum fails of perfect accomplishment because of partial or complete division by traction at the site of ulceration, one should of course still try to preserve all duodenal tissue possible. Needless dissection should be studiously avoided. This has led to many deaths and serious complications by contributing to the insecurity of duodenal closure with resulting postoperative leakage. The most dangerous type of needless dissection attends the efforts to excise, not only the ulcer, but the so-called ulcer-bearing area of the duodenum. This has been referred to as an ideal objective without, to my knowledge, any convincing evidence to support it. As already stated, it is the very exceptional ulcer which fails to heal if favorable conditions are created for healing. Therefore the employment of involved and risky excision technic without promise of compensating benefits appears to be inexcusable. Happily for the patient few surgeons now advocate and practice this technic. Some of the most experienced and skillful operators have tried it and found it too dangerous for continued employment. By his ill advised attempt to remove the ulcer and ulcer-bearing duodenum an occasional operator in this difficult field of surgery can quickly create a situation too complicated for him to handle.

In no field of surgery is the often quoted dictum of Deaver more applicable than here, which is: "cut well, sew well, get well." The duodenal stump can be trusted to heal kindly and satisfactorily only when handled according to this rule. No drain will then be necessary although there is no objection to the use of a soft rubber one.

Mention has already been made of the present-day failure to remove adequate lengths of the lesser curvature. Resection of practically all of it does occasionally increase the difficulty of the operation, but this can be readily accomplished without undue risk and should always be done. A somewhat inaccurate and yet quite satisfactory means of determining adequate removal in this region is to measure the resected stomach segment. It should equal 10 centimeters or more along its lesser curvature. It has been observed quite consistently that the incidence of recurrent ulcer symptoms is much greater in the group with lesser curvature segments shorter than 10 centimeters.

When gastric resections include all antral tissue and two-thirds to three-fourths of the stomach there is little likelihood of a recurrence of ulcer symptoms because of the lasting curtailment of hydrochloric acid production. This is true regardless of the exact type of resection employed. With the corrosive action of the gastric juice eliminated permanently there is no preference, so far as recurrent ulcer symptoms are concerned, between a Polya, a Hofmeister, a Billroth No. 2, or any other type of reliable resection. Likewise, when adequate gastric

resection has been performed, there is no evidence which establishes the superiority of one type of good functioning anastomosis between gastric segment and jejunum over another so far as the occurrence of stomal ulcers and recurrent ulcer symptoms are concerned. Too much has been written on this subject and too frequently impressions of the authors have been given instead of substantial proof. There are real pitfalls too in the attempts to translate results from animal experimentations into deductions which apply to clinical cases. For the cases under consideration there is no proven advantage of the short loop posterior gastro-jejunostomy over the long loop anterior type. Therefore both may be used indiscriminately. I usually employ a Hofmeister type of resection and a short loop posterior colic type of anastomosis but if an anterior type of anastomosis appears to be preferable I have no hesitancy in performing it.

Strict observance of these important factors in gastric resection for duodenal ulcer will give, in good hands, end results which are extremely satisfactory in 90 per cent or more of cases and with mortality rates which have dropped to as low as 1 or 2 per cent in recent outstanding reports. This is particularly noteworthy in view of the fact that under more or less accurate medical management ulcer symptoms continued in these refractory cases and not infrequently were life-threatening due to such serious complications as hemorrhage and obstruction. Also, a relatively high percentage of these cases fall into the group which are major surgical problems even for the most skillful and experienced operators. These results are also gratifying because they concern for the most part individuals who are relatively young and therefore have the promise of many years of active life if cured of their ulcer symptoms.

The present-day deaths and complications arise for the most part from leakage of the duodenal stump—the most usual cause of peritonitis and subdiaphragmatic infection and abscess formation. These complications may also originate from infection primary in and about the ulcer and from contamination resulting from either necessary or dangerous dissection.

Closed or so-called aseptic type of operative technic has to be broken in many of these cases when one prefers to employ it. It provides no safeguards over the open type of resection and anastomosis so far as peritonitis is concerned. The latter complication, as already stated, arises from postoperative leakage of the suture line, nearly always of the duodenal stump, and this leakage, whenever and wherever it occurs, is independent of whether the suturing was done by the open or closed technic. I always employ the open technic without any clamp except the Von Petz, which simplifies and expedites closure of the open end of the proximal gastric segment.

Wound sepsis or infection occurs occasionally but it appears to be less frequent in recent years. It has made its appearance in mild form in three of my cases on whom I employed a transverse or modified transverse incision and cut across one or both recti muscles. Since discarding this incision for a left rectus or left paramedial one, wound healing has been uneventful.

Every person subjected to extensive gastric resection for ulcer must be prepared for a more or less long period of readjustment in the matter of his greatly diminished gastric capacity. The small stomach segment remaining immediately after operation does not permit the ingestion of a full meal. After the lapse of a few months to a year this limited capacity for food usually improves considerably. In the meantime food must be taken oftener than usual. Six meals per day are not infrequent.

Care should be exercised in the amount of food and drink taken at one sitting. Overloading of the segment of stomach remaining occurs frequently and easily, especially during the first few months of convalescence. The most frequent symptoms which follow subtotal gastric resection, whether due to indiscretions in diet or not, are epigastric distress, belching of gas, nausea, and vomiting after meals. Quite rarely some or all of these symptoms occur in more aggravated form together with sweating and weakness. This reaction, which has been called the "dumping" syndrome, is usually an unexplained chain of symptoms which may be quite disturbing but is seldom serious and as a rule clears up satisfactorily with or without treatment.

Weight loss is frequent although substantial postoperative gains are usual. Disturbing symptoms from weight loss are infrequent; when present, weakness is most likely to be the complaint.

The most disturbing symptoms which may follow gastric resection after postoperative recovery are those of continued or recurrent ulcer activity. Our experience leads us to believe that such symptoms should be looked upon as fairly reliable evidence of inadequate gastric resection and, therefore, in the last analysis not due to shortcomings inherent in the operation.

We continue to be interested in clinical laboratory tests for acidity following an Ewald meal in order to gain information about the adequacy of the gastric resection. Our patients have consistently shown no free hydrochloric acid at any time postoperatively and, as is to be expected under this favorable condition, no ulcer symptoms either persistent or recurrent have confronted us.

I have performed what I consider and have described here as an adequate gastric resection for duodenal ulcer on nineteen men and one woman since 1942. The youngest was 28 years of age and three were 67 years old. Of the remaining sixteen, three were in the fourth decade of life, nine in the fifth, and four in the first half of the sixth. All, including the youngest, had had ulcer symptoms over a period of years and all had received medical treatment. In most instances it had been carried out for long periods of time in an approved manner and with satisfactory cooperation of the patient.

This group therefore represents the 10 to 15 per cent of duodenal ulcer cases which fail to obtain satisfactory relief on medical management and which should be

treated surgically. In fact, three of the group had already been operated upon for ulcer—one had closure of a perforation and the remaining two gastro-enterostomies. A gastro-jejuno-colic fistula developed in one of these cases and was causing severe symptoms at the time of the gastric resection. Noteworthy bleeding had occurred in nine of the 20 cases and in six of them it had been repeated, massive and life-threatening, over periods of several years. An unusual and distinct affliction, coarctation of the aorta, aggravated greatly the occurrence of, and danger from, bleeding in one of these massive hemorrhage cases, present in the youngest of the group. Two of the bleeding ulcer cases also had high-grade obstruction. Only two others were likewise afflicted.

Six of the group had so-called refractory symptoms without bleeding and without obstruction. In only one instance was a gastric as well as a duodenal ulcer present. The gastric ulcer, situated at the pylorus, was the cause of the most disturbing symptoms which were those of high-grade obstruction.

At the time of operation bewildering inflammatory and scar tissue changes were found in five cases which were due to ulcers penetrating into the pancreas and hepato-duodenal ligament. In four more cases dense adhesions made the operation difficult and closure of the duodenal stump a matter of concern. Thus in nine or nearly half of these 20 extensive gastric resections by far the greatest technical difficulty was found in and about the pyloric end of the stomach. In no instance was excision of the ulcer a primary objective and in no instance was it known to be removed completely. A one-stage resection was employed exclusively. The pyloric end of the stomach was always removed completely; no transections of the antrum with or without removal of the mucosa were performed. The lengths of the lesser curvature of the excised gastric segments were less than 10 centimeters in some of our earlier cases, but the latter ones have measured from 13 to 18 centimeters.

No bleeding case was operated upon as an emergency. All were well prepared for operation over a period of days and weeks. There have been no deaths either operative or otherwise.

Two instances of subphrenic abscesses occurred. This serious complication became manifest both times after an apparently satisfactory immediate postoperative recovery and after discharge from the hospital. Both patients returned for successful drainage operations. Evidence of infection in the right upper abdominal quadrant appeared in two more cases after an uneventful immediate postoperative convalescence and discharge from the hospital. In each instance recovery without operation followed subsequent hospitalization.

There is only one woman patient among these twenty cases and she developed the so-called "dumping" syndrome without x-ray evidence of abnormal passage of the barium meal into the jejunum and with no free hydrochloric acid present after an Ewald meal. Two-thirds of her stomach was removed for a refractory ulcer. She complained of extreme nervousness, insomnia, palpitation, occasional nausea and frequency of urination before operation in addition to her ulcer symptoms. After operation she felt well for a few weeks and then began complaining again of nervousness, nausea, vomiting after meals, loss of weight, weakness and discouragement. Examination elsewhere including an x-ray gastro-intestinal study failed to show anything noteworthy. Now, twenty months after operation, she has less trouble with nausea and vomiting and is able to do her housework. Weight loss has not been regained.

All of these patients have had and are continuing to have follow-up attention which, with few exceptions, consists of repeated examinations at our clinic. They all continue to live in this territory. None complain of ulcer symptoms and all seem to be free from them. Ewald test meals taken at all periods of time after operation have shown no free hydrochloric acid. No bleeding ulcer case has had a recurrent hemorhrage. No instance of poorly functioning stoma has occurred. Most of the group are farmers and many are performing the hardest kind of farm work. In not a single case is weight loss a matter of serious concern.

In summary, this report concerns twenty duodenal ulcer cases which failed to obtain relief from symptoms after more or less prolonged and accurate medical management. All have survived adequate gastric resections without return of ulcer symptoms and with good evidence of the complete and permanent elimination of the corrosive action of the gastric juice. All, for whom time and age permit, have resumed their work. Nineteen or 95 per cent have had excellent results from surgical therapy. There is reason to hope still for excellent results in 100 per cent of this group of duodenal ulcer cases.

In all four of these cases considerable difficulty at operation was encountered at the pylorus due to penetrating ulcers in two instances and adhesions with marked distortion in all. The closure of the duodenal stump was likewise difficult in all these cases but in each instance it was considered satisfactory. Whether a subsequent infection was due to leakage from the duodenal stump in any of this group was never revealed. Unavoidable contamination at operation is a likely explanation.

ANNOUNCEMENT

The University of Minnesota announces a continuation course in Traumatic and Pediatric Surgery to be presented at the Center for Continuation Study on November 10, 11, and 12, 1949. The course, which is intended for general physicians, will emphasize the diagnosis and management of surgical conditions occurring in children.

American College Health Association News

Infectious Mononucleosis*

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INFECTIOUS MONONUCLEOSIS is an important health problem at many of our colleges and universities. At the University of Michigan Student Health Service, for example, 2,128 cases have been diagnosed since 1929

TABLE 1
Infectious Mononucleosis Occurring at the Univeristy of Michigan*
Comparison of Cases — Years 1928-29 to 1947-48

Year	Number of Cases Men	Women	Total
1928-29	1	0	1
1929-30	5	4	9
1930-31	1	4	5
1931-32	3	0	3
1932-33	3	4	7
1933-34	11	2	13
1934-35	19	4	23
1935-36	20	12	32
1936-37	27	10	37
1937-38	35	27	62
1938-39	41	18	59
1939-40	39	48	87
1940-41	63	58	121
1941-42	61	37	98
1942-43	40	29	69
1943-44	87	49	136
1944-45	260	369	629
1945-46	105	102	207
1946-47	260	140	400
1947-48 (to March 1)	88	42	130
Totals	1169	959	2128

*University of Michigan Student Health Service. Data through courtesy of Dr. W. E. Forsythe.

(Table 1). Although it is generally regarded as a benign disease, over one-half of these student cases required hospitalization. After these patients recovered sufficiently to leave the infirmary many experienced lassitude, weakness, and ease of fatigue for prolonged periods. Some students lost so much time from their classes or did so poorly in their studies during the period of convalescence that they were compelled to leave school for the term. It is apparent, then, that infectious mononucleosis is a significant health, academic, and economic problem to many students as well as to educational institutions. Furthermore, there are appearing in the literature with increasing frequency, reports which indicate that infectious mononucleosis cannot be dismissed as a benign disease of no clinical importance. Indeed, infectious mononucleosis is a systemic infection which may at times endanger life itself or cause serious residual damage to vital organs. Fatal cases, for example, have been ascribed to infectious mononucleosis with manifestations of central nervous system involvement.[1] Encephalitis, meningeo-encephalitis, and the Guillain-Barré syndrome have been observed in association with this infection. Recovery from the acute process usually occurred but in some instances paralytic sequellae resulted.[2,4] Splenomegaly, a common feature of infectious mononucleosis, has been complicated occasionally by spontaneous rupture of the organ.[3,4] About half of these cases terminated fatally.

The occurrence of a transient myocarditis in infectious mononucleosis has been repeatedly demonstrated in electrocardiographic studies.[5,6] There are instances of mitral stenosis which are believed to have been caused by an attack of this disease.[7]

X-ray studies in some patients have revealed pulmonary infiltrations indistinguishable from those of primary atypical pneumonia.[6]

The presenting complaint has at times been severe abdominal pain suggestive of appendicitis and some of these patients have undergone surgical procedures. Hepatitis, with or without jaundice, is relatively frequently encountered. That renal involvement also occurs is evident from the occasional finding of gross or microscopic hematuria, proteinuria, and casts. Thrombocytopenic purpura, acute hemolytic anemia, and hemoglobinuria have rarely been observed in infectious mononucleosis. These examples by no means constitute an exhaustive survey of the clinical features of infectious mononucleosis. They are cited merely for the purpose of demonstrating that the infection can give rise to serious clinical manifestations. In addition, it is evident from these findings that the problem of differential diagnosis in infectious mononucleosis has become exceedingly complex. The majority of cases present sore throat, lymph gland enlargement and irregular fever but these symptoms and signs are by no means pathognomonic. When one includes the occasional occurrence of skin rashes in addition to the previously indicated findings, it is evident that the clinician must rely on laboratory aids in arriving at the diagnosis of infectious mononucleosis.

Ideally, this would be accomplished by the isolation and identification of the causative agent but this is impractical, of course, since the etiology of the disease re-

*From the Department of Internal Medicine, University of Michigan, Ann Arbor, Michigan. This study has been made possible by a grant from the Charles Stewart Mott Foundation.

mains unknown. Most observers, including ourselves, believe it to be a virus infection and transmission experiments to practically every known laboratory animal and even to a few adult humans have been attempted without success. Isolation studies carried out in this laboratory have also yielded negative results. Occasional claims of successful passage have not been substantiated, and Koch's postulates remain unfulfilled.

There are two ancillary means of arriving at the laboratory diagnosis of infectious mononucleosis. The first of these is the examination of the blood for the presence of an absolute lymphocytosis due largely to the appearance of abnormal, though chiefly mature, lymphocytes.[8] This finding is responsible for the name attached to the condition by Sprunt and Evans.[9] No attempt will be made herein to characterize the morphologic aspects of the cell changes observed in infectious mononucleosis but it should be emphasized that the appearance of the atypical lymphocytes in the blood of patients with this disease is part of a dynamic response to the infection. This is important since these so-called infectious mononucleosis cells are known to persist for long periods after the clinical attack and their presence in the blood of a patient may have no relation whatsoever to the present illness. The exact clinical significance of these cells, especially when they are present in low numbers, can be demonstrated only through repeated blood studies and a comparison of findings. Progressive changes in the number and morphology of these cells during the patient's illness and convalescence would strongly suggest the diagnosis of infectious mononucleosis. On the other hand, if the cytologic picture remains relatively static, it would mitigate against the diagnosis. Using these criteria, the diagnosis can usually be made from the characteristic leukocyte changes as they are observed to occur in serial blood studies. Unfortunately, the cellular response is not sufficiently characteristic in a significant number of patients to warrant the unequivocal diagnosis of infectious mononucleosis. It may be that the response did occur but was not observed because of the timing of blood examinations. There are cases, however, which have been closely followed hematologically, in whom the cellular picture could not be differentiated from that observed in other conditions. Infectious hepatitis, for example, gives rise to lymphocytic changes which are quite similar to those seen in some patients with infectious mononucleosis.[10] Since jaundice is encountered at times in the latter disease, it may be impossible to distinguish these conditions either on clinical grounds or on the basis of the blood findings. Thus, it is apparent that laboratory examination of the blood may fail under certain circumstances to provide the evidence needed to arrive at the correct diagnosis.

This lack of uniform success in the diagnosis of infectious mononucleosis from the examination of the blood, combined with the extremely varied clinical manifestations, led us to investigate the second laboratory procedure used in the diagnosis of this disease. This test, the so-called heterophile agglutination reaction, is based on the accidental discovery of Paul and Bunnell [11] that serum specimens from patients with infectious mononucleosis will agglutinate in high titre the red blood cells of sheep. The test has not been entirely satisfactory in the past and a significant number of so-called "false positive" reactions have been reported. A review of the literature, however, suggested that many of the difficulties were not inherent in the test but were due instead to differences in technique, artifacts, and errors of interpretation. Therefore it was decided to adopt a standardized procedure and to study anew the heterophile agglutination reaction.

Basically, the technique of test used in this study is the Paul-Bunnell method with the modifications suggested by Stuart, et al,[12] and by Keiper.[13] Stuart and his associates have shown that the concentration of sheep cells employed in the test and the temperature at which the tests are incubated exert a profound influence on the degree of agglutination. The former of these variables is rendered constant by making the final concentration of sheep cells equal to 0.5 per cent in all of our tests. Stuart further demonstrated that human sera may contain antibodies which agglutinate sheep erythrocytes in the cold and that this phenomenon is reversed by incubation at 37.5° C. Agglutination of sheep red blood cells by infectious mononucleosis sera, on the other hand, occurs at 37.5° C. This titre may be increased by overnight refrigeration at 4° C. In order to dispel any possible "cold agglutinin" effect the test should be returned to the water bath (37.5° C) for two hours and the final reading made.

The test employed in this study involves the use of 0.5 ml. volumes of serial two-fold dilutions of sera which have been previously inactivated for 20 minutes at 56° C. To each tube is then added 0.5 ml. of a 1 per cent suspension of washed sheep cells which are not more than one week old. The sera and cells are mixed thoroughly and incubated at 37.5° C for four hours. At the end of this time the test is read and then placed in the refrigerator where it remains overnight. On the following morning another reading is taken immediately after removing the tubes from the refrigerator. The test is then returned to the water bath for two hours after which the final reading is made. Readings range from 4+ (complete) to 0 (none). Agglutination of 2+ is recorded when at least half of the cells in a tube are estimated to be agglutinated. Any agglutination less than 2+ is arbitrarily ignored in recording the end-point titre.

The reason for using fresh sheep cells under one week old is based on an important observation by Keiper.[13] He noted that the use of sheep cells stored in 3.8 per cent sodium citrate solution yielded inconsistent results in heterophile antibody tests. In some instances, the titres fell from as high as 1:1000 initially to 1:100 after three weeks of storage.

Another important contribution by Keiper was his demonstration that cells from different sheep are agglutinated to a different degree by the same serum sample from a case of infectious mononucleosis. Indeed, in tests with cells from nine different sheep, one serum gave titres ranging from 1:400 to 1:1400. Obviously,

such variations are of significant magnitude and must be controlled if the test is to be of value. This can be accomplished only by utilizing certain criteria which apply to all serologic tests for acute infectious diseases. The problem has been stated elsewhere [11] as follows: " . . . serologic tests are most reliably diagnostic when they reveal a progressive rise in titre in successive serum samples taken during the course of illness and convalescence. The determination of two or more points on the arc of antibody dynamics is usually adequate for diagnostic purposes. Occasionally, however, two serum specimens may give identical titres having caught the antibodies at the same level first during their rise and then during their fall from an intermediate peak. In addition, a plateau effect may be encountered, giving rise to similarity of titres in samples taken during that period." The latter situation is more apt to occur when the agglutination titres are high. This is in part a reflection of limitations inherent to the geometric method of performing serum dilutions. While a rise in titre is the most satisfactory index of antibody response to the disease process, it is also possible to make diagnostic inferences from a progressive fall in titre. This becomes necessary when the first blood sample is drawn after the peak of antibody response has already been reached.

With these points in mind, it is evident that not only must the technique be standardized, but there must also be several blood specimens drawn from each patient. In view of the wide differences in agglutinability of sheep cells as indicated above all the sera from a patient must be run in the same test in order to obtain a relative picture of the antibody change. To be sure, the titres on the same sera can and do vary with different lots of sheep cells. This is of no consequence since it is only necessary to demonstrate a rise or fall in titre to arrive at a serologic diagnosis. The tests on the subjects studied in the present investigation have been standardized in procedure as outlined above and for final analysis all sera from each patient have been run together in the same test. Altogether, 3,385 serum samples

TABLE 2

Sheep Cell Agglutination Study of Mononucleosis at University of Michigan (May 1946 to April 1948)

Diagnosis	Number Cases
Infectious mononucleosis	158
? Infectious mononucleosis	315
? Recurrent infectious mononucleosis	12
94 Miscellaneous clinical entities	737
Total	1222*

*3385 serum samples from these patients.

from 1,222 individuals have been tested so far (Table 2). Interpreted by the criteria presented above, the results of these tests indicate that 158 of the patients had infectious mononucleosis. Examples of the types of responses obtained in these patients are presented in the accompanying tables. A typical "rise and fall" type of antibody curve is shown in Table 3, while Table 4

TABLE 3

Serologic Studies of Mononucleosis at University of Michigan. Agglutination tests on a student nurse.

Days from Onset	Sheep Cell Agglutination Titre After: 4 hours at 37.5° C	overnight at 4° C	2 hours at 37.5° C
4	1/64	1/256	1/64
10	1/256	1/1024	1/256
15	1/512	1/2048	1/512
22	1/256	1/1024	1/256
36	1/64	1/512	1/128
53	1/32	1/256	1/64
67	1/32	1/128	1/64
82	1/16	1/64	1/64
120	1/16	1/128	1/64

illustrates simply a progressive fall in sheep cell agglutination titre. The slope of the downward curve justifies the inference that it followed a recent rise in titre of the antibody responsible for sheep cell agglutination.

TABLE 4

Serologic Studies of Mononucleosis at University of Michigan. Agglutination titre changes in a male student.

Days from Onset	Sheep Cell Agglutination Titre After: 4 hours at 37.5° C	overnight at 4° C	2 hours at 37.5° C
10	1/2048	1/4096	1/2048
17	1/2048	1/2048	1/2048
23	1/512	1/2048	1/1024
31	1/512	1/1024	1/512
37	1/256	1/1024	1/512
46	1/128	1/512	1/256
53	1/128	1/512	1/128
60	1/64	1/256	1/64
68	1/32	1/256	1/64
108	1/16	1/64	1/16

From these serologic studies, the diagnosis of infectious mononucleosis was made in 158 patients. In 315 other patients suspected of having the disease and in 12 patients with possible recurrence of infection, the serologic data would not permit the diagnosis of infectious mononucleosis. In addition, tests were performed on sera from 737 patients with various other clinical entities. The purpose of testing these sera was to determine the degree of specificity of the heterophile agglutination reaction as performed in this study. The previously indicated criteria were applied to these results and all were negative. Some interesting findings were made, however, which will illustrate the necessity for rigid adherence both to the technique of the test and to the criteria for its interpretation. In Table 5, for example, are given the serologic findings in a patient with chronic myelogenous leukemia. The sera from this patient have "cold agglutinins" for sheep cells up to a dilution of 1:256. It appears likely that the "positive" heterophile agglutination tests ascribed to leukemia in the past were due to cold agglutinin effects such as was encountered in this case.

Not infrequently the question is raised as to what constitutes a "positive" titre for infectious mononucleosis in the heterophile agglutination reaction. The answer,

Table 5
Serologic Studies of Mononucleosis at University of Michigan. Agglutination tests in a 40-year-old female with chronic myelogenous leukemia.

Date of Specimen	Sheep Cell Agglutination Titres After: 4 hours at 37.5° C	overnight at 4° C	2 hours at 37.5° C
3-4-48	0	1/256	1/16
3-12-48	0	1/256	1/16
3-22-48	0	1/256	1/16
3-26-48	0	1/256	1/16
4-1-48	0	1/256	1/16
4-14-48	0	1/256	0

which cannot be over-emphasized, is that no single titre is sufficient of itself to make the diagnosis of infectious mononucleosis. To be sure, a very high agglutination titre may be present in a patient who has a highly compatible clinical picture and the characteristic hematologic findings. But the diagnosis is really made on the latter features. The serologic diagnosis can only be made when an antibody response is demonstrated through the examination of several blood samples from the patient in the same test. This point is well illustrated by the findings in tests on sera from a 60-year-old patient suffering from

Table 6
Serologic Studies of Mononucleosis at University of Michigan. Agglutination tests on a 60-year-old male with polycythemia rubra vera and gout.

Date of Specimen	Sheep Cell Agglutination Titres After: 4 hours at 37.5° C	overnight at 4° C	2 hours at 37.5° C
3-26-47	1/256	1/512	1/512
4-10-47	1/512	1/512	1/512
5/2/47	1/512	1/512	1/512
7-15-47	1/512	1/512	1/512
9-11-47	1/256	1/512	1/512
10-14-47	1/512	1/512	1/512
11-9-47	1/512	1/512	1/512
1-17-48	1/512	1/512	1/512
2-20-48	1/512	1/512	1/512
3-23-48	1/512	1/512	1/512

polycythemia and gout. In Table 6 it can be seen that his heterophile antibody titre was 1:512 in March, 1947. Subsequent studies during the following year revealed that this was a constant finding. There was no clinical or hematologic evidence of infectious mononucleosis in this case. Admittedly, as in infectious mononucleosis, the reason for the agglutination of sheep cells by his sera is not known. However, the prolonged maintenance of the agglutination titre at the same level indicates that it is not a response to an acute process such as infectious mononucleosis.

In Table 7 are presented the serologic findings in a patient who appears to have had both syphilis and infectious mononucleosis at the same time. It is well known that infectious mononucleosis may give rise to false positive reactions for syphilis. This effect is transient and the tests will usually become negative within a few days or weeks.[15] The probability of a simultaneous occurrence of the two diseases is extremely remote and this case is presented for its incidental interest.

Table 7
Serologic Studies of Mononucleosis at University of Michigan. Agglutination tests in an 18-year-old girl with mononucleosis and probably syphilis.

Days from Onset	Sheep cell agglutination titres after: 4 hours at 37.5° C	overnight at 4° C	2 hours at 37.5° C	Kahn Units Positive*	CF Cardiolipin Units Positive*
10	1/512	1/1024	1/512	40	A.C.
17	1/256	1/512	1/512	80	224
20	1/256	1/512	1/256	80	—
35	1/64	1/256	1/128	80	224
49	1/64	1/64	1/64	40	—
56	1/16	1/64	1/32	40	224
70	1/16	1/64	1/32	160	224
108	0	1/32	1/8	160	A.C.
143	0	1/16	1/8	160	1
248	0	1/32	0	600	256
339	0	1/16	0	400	384

*Sera also positive in Mazzini, Mazzini cardiolipin, Kline exclusion, Kline cardiolipin, and Kolmer complement-fixation tests for syphilis.

Finally, it should be mentioned that there has been no experience in this study with the absorption tests devised by Davidsohn [16] to differentiate sheep cell agglutination due to the injection of horse serum from that caused by infectious mononucleosis. Some workers have apparently noted discrepancies in the results obtained with his test. Furthermore, modern therapy has practically eliminated the use of horse serum in this country so this problem will be encountered less frequently in the future.

In summary, it may be stated that infectious mononucleosis constitutes a significant student health problem. The etiologic agent is not yet known but is believed to be a virus. Clinically, it is now recognized as a generalized systemic disease with an extremely variable and varied range of manifestations. More serious forms of the disease have been noted and a few fatalities have occurred.

Repeated examinations of the blood for the characteristic leukocyte response and the testing of serial blood samples for sheep cell agglutinins are the most helpful diagnostic aids. Preliminary results of a study of the heterophile agglutination reaction have been presented and although this study is not yet completed, it is believed that sufficient data have been accumulated to indicate the pattern of response in infectious mononucleosis and also to delineate the criteria for its use in the serologic diagnosis of the disease.

Grateful acknowledgment is made to Dr. Cyrus C. Sturgis, chairman of the Department of Internal Medicine, for many helpful suggestions during the course of this study.

Sincere appreciation is expressed to the professional and technical staff at the University Health Service for their continued wholehearted cooperation. Dr. W. E. Forsythe, Dr. W. M. Brace, and Dr. Margaret Bell and their associates have aided greatly in this investigation.

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Official Journal of the American College Health Association
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Editorial

TESTS OFFER HOPE IN CANCER DIAGNOSIS

The average life span in the United States in 1890 was 44 years; now it is approximately 66 for men and 70 for women. Thus, almost a quarter of a century has been added. The increase was due in large part to the control of diseases which caused great destruction during the first two or three decades of life, especially those of infants and young children. One may predict that the recently acquired sulfonamides and antibiotics will prevent so many untimely deaths from infections, particularly pneumonia, as to further increase the span of human life by several years.

Cancer is one of the conditions which has continued the destruction of life almost unabated. Five years ago, 170,000 deaths were so reported. This was increased by 12,000 in 1946 and it is believed that 200,000 lives will be lost in 1950. When the span of human life was only 44 years, deaths from cancer did not play such a large role as other conditions in holding the average length of life at this level because approximately 90 per cent of its victims die after the age of 40 years. While it does occur among infants and young children, it is rare and, in fact, only 10 per cent of all cancer deaths are reported under the age of 40. Obviously the more persons who live to be old, the higher will be the incidence of cancer among them.

The total absence of significant symptoms of early and small cancers in organs with large functional reserve—the so-called silent period—permits the condition to become large and all too often to metastasize before the patient is seen by the physician. In an organ like the lung, containing no sensory pain fiber, this silent phase may be of definitely greater duration than in organs richly supplied with such fibers.

Involvement of the stomach is the first cause of cancer deaths and that of the lungs, second. The five-year survival rate following surgical treatment of cancer of the stomach varies somewhat in reports but is in the neighborhood of 8 to 10 per cent. This is not because of the inability of surgeons, but largely because of the lack of significant symptoms until metastases have occurred.

Much progress has been made in diagnostic procedures in recent years. If opportunity is given to make necessary examinations, including x-ray inspections, bronchoscopy and biopsy as well as cytological studies of sputums, gastric washings and bronchial aspirations, cancer of the lungs can now be diagnosed with considerable accuracy. In any such condition that is microscopic in the beginning and that evolves slowly, there is no hope of becoming aware of its presence until gross lesions have developed. In the entire cancer control program the most urgent need is a specific test that will detect the presence of malignancy soon after it appears. As soon as this test indicates the presence of the disease, the physician could begin to make frequent, careful examinations of those parts of the body most frequently attacked by cancer. Thus, one might hope to determine the location of most cancers as soon as they are large enough to be found by our present diagnostic armamentarium. Unless such a test becomes available, it is probable that we will continue to diagnose cancer, particularly of internal organs, after the majority have metastasized.

We now have such specific tests for a number of other diseases. For example, tuberculin is highly specific and accurate in determining the presence of tuberculous lesions long before they can be located. By carefully examining tuberculin reactors periodically one is often able to locate the chronic, slowly progressive lesions on an average of two or three years before symptoms or contagion are present. Every physician recognizes the need of such a specific and accurate test for cancer before lesions can be located. A large volume of work has already been done in this field. Some persons have lost hope. However, encouragement may be found in the fact that since the 20th century began, specific tests have come into being and have great practical value in the early diagnosis of several diseases. Since nothing is so needed in the entire cancer field, a great deal of time, money and effort should be spent in seeking such a diagnostic agent.

J. A. MYERS, M.D.

American College Health Association News

A number of vacancies in College Health Services have been reported.

Wayne University, Detroit 1, Michigan, reports a vacancy for a male physician. The position is a permanent, full-time appointment and carries the usual privileges of paid vacations, sick-leave, and retirement benefits. The physician will be assigned to the medical supervision of the University inter-collegiate and intra-mural athletic program. The starting salary is good with annual increments. Write to Dr. Irvin W. Sander, M.D., 5050 Cass, Detroit 2, Michigan.

There is also a vacancy in the Student Health Department of the State University of Iowa. For further information, write to Dr. C. I. Miller, Director Student Health, Iowa City, Iowa.

The University of Pennsylvania, Philadelphia, Pennsylvania, will need a full-time physician for next July 1st. Anyone interested may write to Dr. H. D. Lees, Student Health Service, University of Pennsylvania.

Several inquiries have been received regarding the availability of positions for graduate, registered nurses for student health work in colleges and universities. Any information about such openings would be appreciated.

News Briefs

North Dakota

Specialists in internal medicine from North and South Dakota and Canada met in Grand Forks September 10 for the third annual regional meeting of the American College of Physicians. Special guest at the session was Dr. George F. Strong of Vancouver, B. C., first vice president of the college, who presented a paper on infectious mononucleosis.

More than 30 members of the American College of Physicians attended the meeting.

Dr. H. W. Miller, who began his career as a "country doctor" in Casselton in 1912, made plans to retire after pneumonia hospitalized him recently. Dr. Miller's faithfulness to serve prompted the Casselton Commercial Club to sponsor a Dr. H. W. Miller Appreciation Day on June 10, 1945.

John A. Page, of the University school of education, has been granted a year's leave of absence by the board of higher education to take up full time duties as director of the North Dakota medical center. The appointment took effect September 1.

The new full-time director came to Grand Forks in 1935 from Bismarck where he had served for eight years as state director of secondary education.

Dr. Frank M. Melton of Louisville, Ky., dermatology specialist, has joined the staff of the Dakota Clinic. A graduate of the University of Louisville Medical School, Dr. Melton served with the U. S. Public Health Service. From 1946 to 1948 he did postgraduate work at the University of Pennsylvania. Prior to coming to Fargo Dr. Melton was associate in dermatology at Duke Hospital, Durham, N. C.

Dr. Gordon Magill of Fargo, accompanied by his wife, sailed recently from New York for Cairo, Egypt, where he will spend two years in general medical research with emphasis on his special interest, diseases of the liver and bile ducts.

Dr. Magill has been on the staff at St. Albans naval hospital, St. Albans, N. Y. His wife, also a physician, completed her internship this year at a Brooklyn hospital. While in Egypt, Dr. Magill will be a member of the medical research unit established in 1943.

Dr. Ilmar Otto Kiesel, first of the DP doctors to be brought to North Dakota through the Lutheran Welfare program, arrived in Fargo recently. Dr. Kiesel, a former resident of Estonia, will serve as physician in the Page community following an internship of a year at St. Luke's hospital in Fargo. In Europe, Dr. Kiesel specialized in internal medicine and x-ray diagnosis.

A new member of the staff of New Rockford City Hospital is Dr. Julius Kolacskovszky, native of Hungary who in September began the serving of a year of internship at the local hospital.

Dr. Kolacskovszky is a graduate of the University of Budapest. Following his year of internship at City Hospital, Dr. Kolecskovszky will open his own practice in Buffalo, N. D.

New Appointments . . .

Dr. William Tompkins, to the staff of the Tompkins Countryman Clinic at Grafton.

Dr. Charles M. Graham as city health officer at Grand Forks. A 1936 graduate of the University of North Dakota, Dr. Graham received his medical degree from Northwestern university in 1939.

New Locations . . .

Dr. P. C. Van Lier, associated with the Johnson Clinic at Rugby for the past year and a half, is establishing a practice in Sioux Falls, S. D.

Dr. G. S. Wheeler, formerly of Winnipeg, Manitoba, has opened offices in Portland.

Dr. John McNeil of Hettinger will serve as resident surgeon at the Bismarck Hospital in Bismarck, N. D., for the next few months, reopening his Hettinger office about January 1, 1950.

South Dakota

The University of South Dakota school of medicine has recently been awarded $5,000 from the Federal Security Agency to coordinate and improve cardiovascular teaching. Project director is Dr. T. E. Eyres, professor of public health.

Dr. Willard O. Read of the University of Missouri was recently appointed associate in physiology; Dr. Donald F. Rayl, associate in clinical physiology; and Dr. Tom Billion, clinical associate in physiology. Dr. T. H. Sattler, assistant professor of medicine, will handle the clinical end of the teaching correlating it with the basic science facet of cardiovascular teaching. Dr. James C. Steele has been appointed assistant professor of radiological anatomy and clinical assistant professor of radiology. Also, Dr. F. J. Abts has been raised to clinical associate professor of gynecology and Dr. C. B. McVay has been raised to associate professor of surgical anatomy.

A committee has been appointed to outline plans for Brookings county to participate in the campaign to raise funds for the construction of a crippled children's hospital and school in eastern South Dakota.

Four Huron doctors have each practiced medicine more than 50 years and in observance of their work have been awarded membership in the 50-year club by the South Dakota Medical Association. They are Dr. O. R. Wright, Dr. F. L. Class, Dr. H. L. Saylor and Dr. T. J. Wood. There are now six doctors in the state who hold the 50-year award.

WITH THE RETIREMENT of Dr. F. H. Creamer in September Dupree is really without a doctor for the first time in its history. Dr. Creamer came to Dupree with the opening of settlement in 1910 and has been there ever since with the exception of the time he served in the Army in World War I. Since then he has administered to the people of the West River Country, a territory more than 100 square miles and is no doubt the largest territory any practicing doctor in the United States covered in his regular practice.

Relocations and Appointments . . .

DR. R. W. MCMULLEN, a graduate of the school of medicine, College of Medical Evangelists, at Loma Linda, California, with service as a medical missionary in China, has opened medical practice in Bowdle, S. D.

DR. J. V. YACKLEY, formerly of Denison, Iowa, is now associated with Dr. John Erickson in Rapid City. Dr. Yackley is a graduate of the medical college at Creighton university and served his internship at St. Catherine's hospital in Omaha.

DR. ROBERT F. SWANSON, of Dwight, Illinois, and a graduate of the Northwestern University Medical School, is opening a practice in Platte.

LT. JG ROBERT J. FOLEY, of Blair, Nebraska, has been assigned to the Rapid City air base hospital. Lt. Foley is a recent graduate of the Air Force School of Aviation Medicine at Randolph, Texas.

Minnesota

FOR DISTINGUISHED SERVICE in cancer control, Dr. Owen H. Wangensteen, head of surgery at University of Minnesota, received the first annual medal of the Minnesota division of the American Cancer Society on September 23.

The cancer society's announcement described the Minneapolis surgeon as "world famous in many fields."

It cited his development of an infection-preventing technique of sewing together the intestine and the stomach after surgery, aggressive surgery of gastro-intestinal cancers including removal of parts of adjacent organs and his leadership in urging early diagnosis of stomach cancer.

DR. E. S. MARIETTE, superintendent of Glen Lake sanatorium since 1916, resigned September 8 because of illness.

Born in Blue Earth county in 1888, Dr. Mariette attended Pillsbury academy at Owatonna, Minn., and the University of Minnesota. He interned at University Hospitals, joined the Glen Lake staff in 1916 and soon became superintendent and medical director.

He is an assistant professor of medicine at the University of Minnesota and a member of nineteen medical and health organizations.

He was twice on the National Tuberculosis Association's board of directors and in 1935-36 an executive committee member. He has headed the Minnesota Trudeau Society, the Hennepin County Tuberculosis Association, the Minnesota Hospital Association, the Minnesota Sanatorium Association, the Mississippi Valley Trudeau Society and the Mississippi Valley Tuberculosis Conference.

Three graduates of the University of Minnesota medical school were elected officers of the Northwestern hospital staff at the annual meeting at the hospital on September 19.

Dr. Erling W. Hansen was elected president, succeeding Dr. R. S. Ylvisaker. Dr. Claude J. Ehrenberg was elected vice president to succeed Dr. Edwin Benjamin and Dr. Albert T. Hays was re-elected secretary-treasurer.

Believed to be the first project of its kind on a comunity-wide basis, the health committee of the Virginia Chamber of Commerce will sponsor a diabetic survey during the week of October 10-16.

Aim of the survey is to uncover unsuspected cases of diabetes which has been one of the leading causes of death in Minnesota during the last twelve years. Last year it occupied seventh place among leading causes of death.

DR. PHILIP S. H. HENCH and DR. EDWARD C. KENDALL, Mayo clinic men who launched the spectacular new use of cortisone—compound E—for arthritis, will share a high scientific honor. It is a 1949 Lasker award for administrative and scientific achievement—a $1,000 prize and a figure of "Winged Victory." They will receive the award in New York City October 25 at the annual meeting of the American Public Health Association.

DR. TOM DAVIS, JR., of Wadena, has made arrangements to spend three months doing specialized work in eye surgery in India, and will leave Wadena in October for that country. He will work and study in a Catholic mission 200 miles north of Calcutta. Dr. Davis has been specializing in eye, ear, nose and throat work.

A dinner of staff doctors of the Rice Memorial Hospital was held at which time the medical men paid tribute to Dr. E. H. Frost, who on April 11 completed fifty years as a medical practitioner in Willmar.

THE AMERICAN ACADEMY OF NEUROLOGY at its first national scientific meeting elected Dr. A. B. Baker of Minneapolis president, Dr. Pearce Bailey of Charleston, S. C., vice-president, and Dr. Joe R. Brown, Rochester, secretary. Three hundred attended the sessions; 38 papers were presented.

MYRON WEAVER, M.D., formerly on the staff of the University of Minnesota Medical School, and now at the University of British Columbia, will take part in a round-table discussion at the 60th meeting of the Association for American Colleges to be held at Colorado Springs in November.

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1. McGavack, T. H. and Klotz, S. D.: Bull. Flower Fifth Ave. Hosp., 9:61, 1946.
2. Weissberg, J., McGavack, T. H. and Boyd, Linn J.: Am. J. Digest. Dis., 15:332, 1948.

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Future Meetings

The North Dakota Health Officers Association is holding its annual meeting with the North Dakota Public Health Association in Grand Forks, November 10, 11 and 12, 1949. Of special interest this year is the banquet session at which Dr. F. S. Crockett, chairman of the committee on rural health of the A.M.A., will be the guest speaker.

The University of Minnesota offers these special courses in medicine at the Center for Continuation Study on the campus:

OCCUPATIONAL AND PHYSICAL THERAPY, October 13 and 14. Dr. H. D. Bouman, professor of physical medicine, University of Wisconsin Medical School, will be the guest speaker.

DISEASES OF THE CHEST, October 20, 21 and 22. Sponsored by the Minnesota Chapter of the American College of Chest Physicians, this course is intended for general physicians.

PEDIATRIC ROENTGENOLOGY, October 31 through November 5. Intended for radiologists and pediatricians.

OBSTETRICS, November 17, 18 and 19. Dr. S. R. M. Reynolds of the Carnegie Institute of Washington and Johns Hopkins Medical School, will be guest faculty member.

CHILD PYSCHIATRY, November 28 through December 3. Intended for pediatricians and general physicians, this course will emphasize normal, emotional, intellectual and social development of infants and children. Dr. Adrian Vander Veer of the Department of Psychiatry, University of Chicago, will participate as a visiting faculty member.

Dr. John Caffey, associate professor of pediatrics in the College of Physicians and Surgeons at Columbia University, New York, will present the annual Leo G. Rigler lecture at the University of Minnesota Medical School Wednesday, November 2, at 8:15 P.M. Dr. Caffey will speak on the subject, "Some Normal Variations in the Growing Skeleton: Their Clinical Significance" and his lecture will be given in the auditorium of the Minnesota Museum of Natural History.

Opportunities Offered

THE AMERICAN GOITER ASSOCIATION again offers the Van Meter Prize Award of Three Hundred Dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the Association which will be held in Houston, Texas, March 9, 10 and 11, 1950, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double-spaced copy in duplicate sent to the Corresponding Secretary, Dr. George C. Shivers, 100 East St. Vrain Street, Colorado Springs, Colorado, not later than January 15, 1950. The committee, who will review the manuscripts, is composed of men well qualified to judge the merits of the competing essays.

A NEW PROGRAM of scholarships will be offered to undergraduate students by the Minnesota Medical Foundation, Dr. Owen H. Wangensteen, president, announced. The scholarships will be awarded annually in amounts totalling $2,500. Individual grants will range between $500 and $1,000. Members of the sophomore, junior and senior classes are eligible to apply for the scholarships.

Deaths

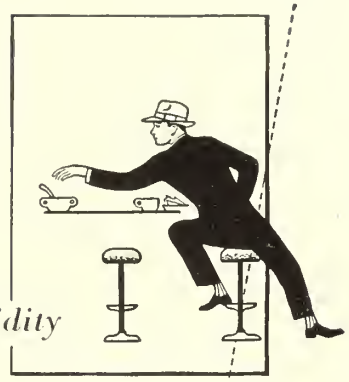
DR. MARTIN U. IVERS, 81, Richland county physician 46 years, died on September 13 in Fargo, N. D. He entered University of Minnesota medical school and received his doctor's degree there in 1902. In 1903, he began the practice of medicine at Abercrombie, continuing there until 1918. Dr. Ivers and his brother, Dr. Lewis U. Iverson of Christine, cared for patients in a territory ranging from Wahpeton to Fargo, covering the district with horse and buggy in early days and later by car. In addition to caring for his patients, Dr. Ivers prepared his own drugs each evening.

DR. H. H. DANIELS, 70, a physician in the Hankinson, LaMoure and Milnor area for the past 11 years, died unexpectedly last month in his office-residence at Milnor, North Dakota.

DR. ALEXANDER B. FIELD, 86, pioneer doctor of the Forest River area, died August 29 at a Grafton, North Dakota, hospital. He had practiced medicine in Forest River since 1892. He was a member of the Forest River city council and the school board for many years. Dr. Field was born at Blackstock, Ont., Canada, on June 12, 1863, and obtained his medical degree at the University of Toronto in 1891.

DR. NORMAN R. SCHNEIDMAN, 42, chief of pulmonary diseases section at Veterans Hospital, Minneapolis, died September 6. Only recently he completed postgraduate work at the university in internal medicine.

DR. WALTER E. CAMP, leading Minneapolis eye and ear doctor for the last 30 years, died Sunday at Northwestern hospital after a long illness. He was 60. Dr. Camp was born in Springfield, Mo., September 21, 1889. He received his bachelor of arts degree from University of Missouri in 1912, and his master of arts and doctor of medicine degrees for the University of Minnesota in 1915.



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DR. FAYETTE D. KENDRICK, probably St. Paul's oldest physician, died August 24th in Miller Hospital. He would have been 94 in November. Dr. Kendrick had been a resident of St. Paul since 1903.

DR. GEORGE E. MALMGREN, formerly of St. Paul, died August 24th in Los Angeles following an operation. He was 47 years old. He had served on the staff of the Mayo Clinic at Rochester for several years until he left for California 12 years ago.

Book Reviews

Constructive Uses of Atomic Energy, edited by S. C. ROTHMANN. New York: Harper and Brothers, 223 pages, 1949, $3.00.

Much has been said about the destructive value of atomic energy and there has been some speculation about the use of atomic energy in everyday life. Mr. Rothmann has collected the contributions of fourteen scientists who are among the leaders in atomic research in many fields. Each of these individuals has attempted to express his thoughts on the value of atomic energy for constructive purposes.

As one reads about atomic energy he becomes impressed with the amount of scientific know-how that went into the work of learning how to split the atom. Although science had been aware of the atomic theory for several hundred years, it took the necessity created by a war to cause the scientific minds to be brought together and learn how to use the atom. Several billion dollars were spent to accomplish this purpose, but to date very little of this money has been recovered and only the destructive value of atomic energy has been enthusiastically pursued. As one reads and learns of the many possible uses already thought up for atomic energy, he realizes quite possibly we humans are entering on an atomic age where the constructive uses for atomic energy will be widespread and will more than pay for its original cost of discovery. The medical applications alone should be well worth the expenditure.

Dr. C. P. Rhoads in his section on "The Medical Uses of Atomic Energy" points out that only two elements have been proven to be therapeutically useful but he also suggests that we have only just started our investigations and that radioactive isotopes may be the answer to not only the therapeutic treatment of diseases such as cancer but, more important, there will come a new era of knowledge of the fundamental chemical processes of the body. Most people think of atomic energy as a destructive force which, when released as a bomb, causes sudden death if one is in the direct path of it, or a lingering death if the radioactive waves are encountered. Throughout the book it is pointed out that man can use atomic energy with safety if he takes proper precautions. As man loses his fear of the atom and commences to harness it for his own purposes, so will the atomic age gain momentum. S.C.R.

Emotional Maturity: *The Development and Dynamics of Personality,* by LEON J. SAUL, M.A., M.D. Philadelphia: J. B. Lippincott. 338 pages. 1947. $5.00.

The primary interest of modern psychiatry as Dr. Saul points out in his preface is no longer the insane or psychotic but rather the emotional behavior of neurotic individuals and so-called normal people. The broadening of this horizon which now includes all mankind within the purview of psychiatry must also broaden the horizon of all practitioners of medicine to include the emotional aspects in the consideration of the problems involved in any case. These are the grand concepts which led to the writing of this book.

Saul draws heavily upon his recent wartime naval experience. His opportunity to observe extreme emotional behavior problems seen among military personnel on combat duty gave him a good share of the illustrative material he uses here.

R. B.

The Premature Baby, by V. MARY CROSSE, M.D. Philadelphia: The Blakiston Company, 156 pages with 14 illustrations, 1947. $3.00.

This book is a complete review of our up-to-date knowledge concerning the premature baby. The author has placed all the information into eight chapters, each one of which presents in detail but in a practical way the most essential factors necessary to take care of the premature infant from the moment of birth through the first period of his life. Nothing has been overlooked. Emergencies and complications are mentioned and treated accordingly. The monograph is highly recommended for general practitioners and nurses, obstetricians and pediatricians.

A.V.S.

A Primer of Electrocardiography, by GEORGE E. BURCH, M.D., F.A.C.P., and TRAVIS WINSOR, M.D., F.A.C.P. Second edition, 245 pages with 265 illustrations. 1949. Philadelphia: Lea & Febiger. $4.50.

The revision of this standard primer by Dr. Burch, Henderson Professor of Medicine at Tulane University, and Dr. Winsor, Assistant Clinical Professor of Medicine at the Southern California Medical School, should be welcomed by practitioners and students unfamiliar with the subject for the fundamentals of electrocardiography are presented in a most direct manner. Mechanisms responsible for the various patterns of infarction are discussed in detail and are supported by numerous new illustrations. Unipolar leads replace bipolar precordial leads and the illustrations and comments have been changed accordingly. A new feature is a discussion of the intrinsic deflection.

The material is presented from a mechanistic point of view for the authors believe that only with a knowledge of the mechanism is it possible for the reader of electrocardiograms to unravel individual tracings.

This fully up-to-date primer offers a foundation upon which to build a useful, practical and theoretical mastery of electrocardiography. After thorough understanding of fundamentals presented in this primer, a more advanced study of the subject can follow.

Correlative Neuroanatomy, by J. J. MCDONALD, M.D., J. G. CHUSID, M.D., and J. LANG, M.D.; 4th edition; Palo Alto: University Medical Publishers, 1948, $3.00.

This is a manual planned for Stanford University students in gross anatomy, neuroanatomy, neurodiagnosis and neurology. It includes the clinical findings of the important neurologic disorders. The first part deals with peripheral nerves, and the autonomic system. Part two is devoted to neurological diagnosis including diagnostic procedures such as electromyography and electroencephalography. The third part is devoted to the important diseases, and is followed by an appendix outlining signs, syndromes, atrophies and distrophies.

The book is paper bound with a plastic spiral-type binding. It is brief, clear and entirely in outline form, with important words and phrases underlined, numerous line illustrations, and several charts. Either the student or clinician wishing to refresh by means of this outline technique could make good use of this book.

H. W.

A Layman's Handbook of Psychiatry, by WINFRED OVERHOLSER, M.D., and WINIFRED V. RICHMOND, Ph.D. Philadelphia: J. B. Lippincott Company, $4.00.

The authors have presented this informative, nontechnical handbook to the public in an effort to provide more knowledge and appreciation of the field of psychiatry. It should prove valuable in dispelling the popular misconception about mental illness, its etiology, treatment, and prognosis. A discussion of the schools of psychiatric thought and explanations of the mechanisms involved in producing various types of mental disorders are given with clarity and conciseness. Illustrative cases are chosen wisely. A discussion of the relation of mental illness to war and crime is also commendable. The treatment of the entire subject is prudent and refreshingly unsensational with no loss of the reader's attention and enjoyment.

F. T.

The JOURNAL LANCET

Minneapolis, Minnesota
November, 1949

Vol. LXIX, No. 11
New Series

Surgery of the Sympathetic Nervous System*

Collin S. MacCarty, M.D.†
Rochester, Minnesota

Because of recent advances in surgery of the sympathetic nervous system, it seems appropriate at this time to review the subject. A critical analysis should emphasize its importance and also indicate its abuses.

This type of surgery was introduced by Jabolay [1] in 1899. Alexander [2] and Jonnesco [3] also were pioneers in this field. Although Jabolay introduced periarterial sympathectomy, its extensive use by neurologic surgeons is chiefly attributable to the work of Leriche.[4] Royle,[5] Adson [6] and other neurologic surgeons have described new technics and have made other valuable contributions to this field.

Anatomy

In man, the spinal sympathetic centers extend from the first thoracic to the second lumbar spinal segments. The paravertebral ganglia extend down to the coccygeal region and up into the neck where there are only three instead of eight cervical ganglia. The inferior cervical ganglion is formed by fusion of the seventh and eighth ganglia, the middle cervical gangion is formed by fusion of the fifth and sixth ganglia, and the superior cervical ganglion is formed by fusion of the upper four cervical ganglia.

The sympathetic nerve supply of the skin of the head, neck and occulopupillary region is as follows.[7] The preganglionic fibers arise in the lateral horn of the spinal cord at the level of the first and second thoracic segments, with occasional variation upward or downward. These fibers pass outward through the anterior root and enter the sympathetic chain without synapse. They ascend in the sympathetic trunk to the superior cervical sympathetic ganglion where they synapse with postganglionic fibers. The postganglionic fibers ascend in the sheath of the internal carotid artery to the orbit and in the sheath of the external carotid artery to the skin of the face, the salivary glands and the cervical plexus. Some fibers from the superior cervical ganglion seem to join the phrenic nerve.

The sympathetic nerve supply of the upper extremities (Fig. 1) is segmental in its distribution.[7] The preganglionic fibers arise in the second to tenth thoracic spinal segments or thereabouts. They ascend without synapse in the sympathetic trunk. They then synapse with the postganglionic fibers in the first thoracic ganglion and inferior cervical ganglion (stellate ganglion). A few synapses occur with the middle cervical ganglion. The postganglionic fibers, the majority of which are in the stellate ganglion, join the roots of the brachial plexus.

It is clear from this description that the upper extremity, neck and head can be easily denervated by any procedure that interrupts the sympathetic fibers at the stellate ganglion or the second thoracic ganglion. Anomalous arrangement of parts of the sympathetic system, however, is notably common, particularly around the great plexuses. In this particular region, it has been difficult to perform a procedure which is complete on all occasions. The inadequacy of the cervicothoracic procedure in the past has been explained on the basis of sensitivity to epinephrine if a postganglionic sympathectomy was performed. In the upper extremity, if the stellate ganglion is removed, the operation is postganglionic because the nerves whose cell bodies lie in this ganglion and whose axons go to the brachial plexus have been

*Read at the meeting of the North Dakota State Medical Association, Minot, North Dakota, May 17, 1949.

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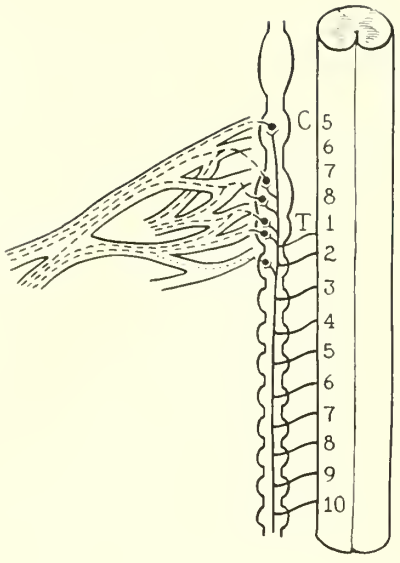


Fig. 1. Sympathetic innervation of the upper extremity. Preganglionic fibers originate in the lateral horns of the spinal cord from the first thoracic segment to the tenth thoracic segment. The fibers ascend in the sympathetic trunk to the middle cervical, stellate and second thoracic ganglia. The postganglionic fibers originate here and send their axons to the brachial plexus.

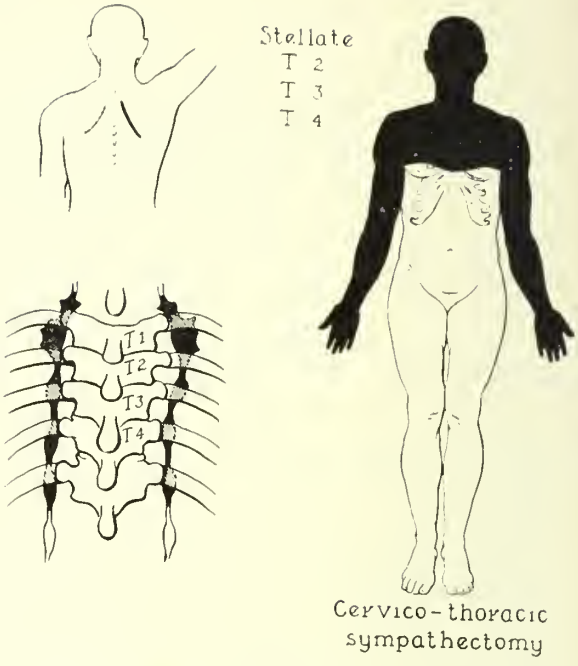


Fig. 2. Cervicothoracic sympathectomy with removal of stellate ganglia and second, third and fourth thoracic ganglia. Area of anhidrosis indicates extent of sympathetic denervation.

destroyed. If, however, the second thoracic ganglion is removed, the postganglionic cells sending fibers to the brachial plexus are left intact and the sympathetic supply to the extremity is disconnected only from its central nerve supply in the cord. This constitutes a preganglionic sympathectomy. Fatherree, Adson and Allen [8] proved the discrepancy in the preganglionic and postganglionic theory of sensitivity to epinephrine, and since the report of their work the tendency has been toward making the cervicothoracic sympathectomy more complete anatomically.

The extent of sympathectomy can best be determined by sweating tests which outline the areas of anhidrosis (Fig. 2). A satisfactory cervicothoracic sympathectomy produces absence of sweating on the face, neck and upper extremity. If the stellate ganglion is removed, Horner's syndrome results. I prefer a sympathectomy that removes the stellate and upper four thoracic ganglia. This is easily accomplished from an extrapleural approach by removing the third rib posteriorly.

Considering briefly the sympathetic nerve supply of the heart [7] (Fig. 3), the preganglionic fibers arise in the lateral horns of the cord at the first to the fifth spinal segments. Some fibers, those arising from the first to the third thoracic segments, ascend to the cervical ganglia. The rest go to the corresponding paravertebral ganglia. These preganglionic fibers synapse with the postganglionic fibers in the three cervical ganglia and the upper five thoracic ganglia. The postganglionic fibers form the cardiac nerves and cardiac plexus. The superior cardiac nerve arises from the superior cervical ganglion, the middle cardiac nerve arises from the middle cervical ganglion, and the inferior cardiac nerve arises from the stellate ganglion. The other postganglionic fibers go directly to the cardiac plexus from the upper five paravertebral ganglia.

The surgical importance of this anatomic description rests in the fact that visceral sensory fibers from the heart travel over the middle and inferior cardiac nerves and upper five thoracic sympathetic nerves. The superior cardiac nerve does not seem to carry visceral afferent fibers from the heart. It is clear that while removal of the stellate ganglion eliminates the afferent supply from the cardiac nerves it does not interfere with the direct

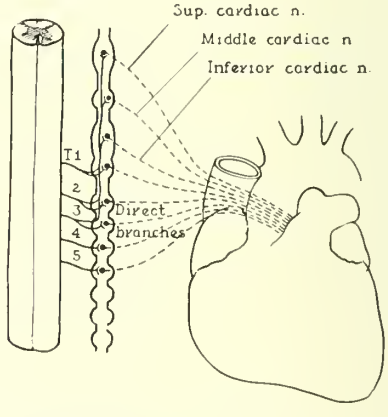


Fig. 3. Sympathetic nerve supply of the heart. Preganglionic fibers arise in upper five thoracic segments. Postganglionic fibers arise in superior, middle and inferior cervical ganglia and upper five thoracic ganglia. Visceral afferent fibers from the heart travel over this system exclusive of the superior cardiac nerve.

supply from the upper thoracic nerves; therefore, to obtain the best relief from cardiac pain one should resect the posterior roots of the upper five thoracic nerves through which most of the visceral sensory axons from the heart run.[9]

The sympathetic supply to the abdominal viscera (Fig. 4) is about as follows.[7] The preganglionic fibers arise in the lateral horns of the spinal cord from about the fourth or fifth thoracic to the second lumbar segment. The preganglionic fibers pass through the corresponding paravertebral ganglia to the three splanchnic nerves. The greater splanchnic nerve begins at the fourth or fifth spinal segments and it also receives fibers from segments as low as the ninth thoracic. The lesser splanchnic nerve is composed of fibers from the tenth and eleventh thoracic segments. The lowest splanchnic nerve consists of fibers derived from the twelfth thoracic and first lumbar segments. The preganglionic fibers travel in the splanchnic nerves and upper lumbar rami, and synapse with the postganglionic fibers in the celiac, superior mesenteric and aorticorenal ganglia. The post-

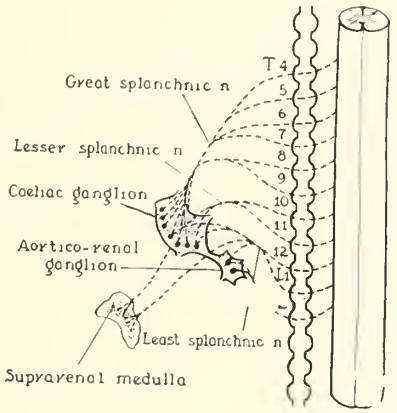


Fig. 4. Sympathetic nerve supply of the viscera is derived from the fourth thoracic segment to the second lumbar segment. The preganglionic fibers travel over the splanchnic nerves to the celiac and aorticorenal ganglia and suprarenal medulla. Postganglionic fibers arise in the celiac and aorticorenal ganglia and travel by the blood stream to the viscera.

ganglionic fibers arising in these ganglia join the main blood vessels by which they reach the various organs. The sympathetic nerves to the adrenal gland are also preganglionic and are derived from the splanchnic nerves and from the upper lumbar chain.

The operations devised by Adson,[10] Craig and Adson,[11] Peet,[12] Smithwick,[13] Poppen [14] and others have been designed for the explicit purpose of denervating the viscera by removing the splanchnic nerves, paravertebral ganglia and plexuses for the control of hypertension.

The sympathetic supply to the lower extremity (Fig. 5) is as follows.[7] The preganglionic fibers arise between the tenth thoracic and second lumbar segments. They descend in the sympathetic trunk. They synapse in the segmental paravertebral ganglia connected with the segmental nerves supplying the obturator, femoral and sciatic nerves. The sciatic nerve consists of fibers derived

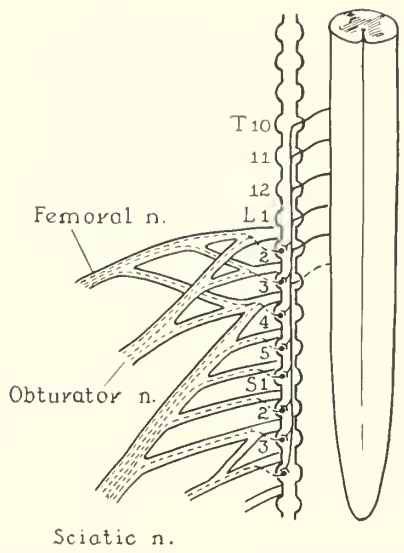


Fig. 5. Sympathetic nerve supply of the lower extremity. Preganglionic fibers arise from the tenth thoracic segment to the second or third lumbar segments. The postganglionic fibers arise segmentally in the paravertebral ganglia and go to the corresponding roots making up the femoral, obturator, and sciatic nerves.

from the roots of the fourth and fifth lumbar and the first three sacral nerves. The femoral and obturator nerves consist of fibers derived from the roots of the first three lumbar nerves. The postganglionic fibers arise in these paravertebral ganglia and travel over the corresponding nerves to the lower extremity. Denervation of the lower extremity (Fig. 6) is thus a relatively simple matter. Removal of the first two or three lumbar ganglia

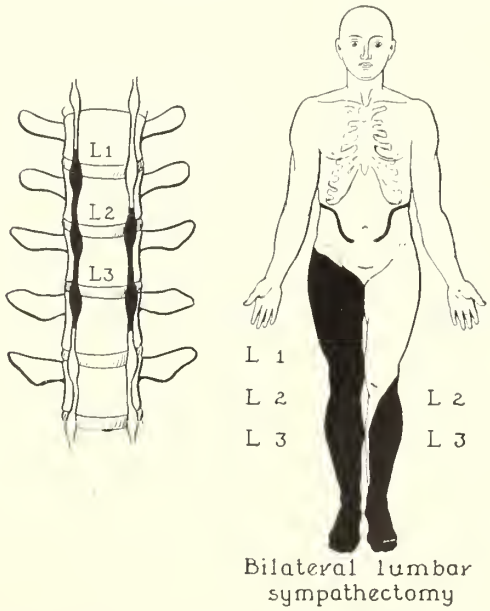


Fig. 6. Incision and areas of anhidrosis established by severing the first, second and third lumbar ganglia or the second and third lumbar ganglia.

will interrupt the sympathetic nerve supply of the entire leg. In men, sterility is more likely to occur after removal of the first, second and third lumbar ganglion than it is after removal of the second and third lumbar ganglia only.

Since Flothow [15] and Pearl [16] described the anterior, extraperitoneal, muscle-splitting approach to the lumbar sympathetic chain, the problem of lumbar sympathectomy has been simplified. Shelden, Pudenz, and I [17] have added an S-shaped incision. I more or less routinely operate on both sides at one time, thus eliminating many days of hospitalization and the morbidity which formerly occurred when the posterior approach through the flank was used. By this method the patient is spared an extra operation and anesthesia. It is possible to interrupt the sympathetic nerve supply of the entire lower extremity by removing the upper three lumbar ganglia, or to remove this innervation of only the lower part of the leg and foot by removing the second and third lumbar ganglia.

Indications for Sympathectomy

Peripheral Vascular Disease of Vasospastic Origin. Raynaud's disease occurs five times as frequently in females as it does in males. The onset usually occurs before the age of 40 years. The disease is characterized by episodes, in the distal portion of the extremities, of pallor, cyanosis and rubor on exposure to cold or emotional stress. It is usually bilateral. Massive gangrene is rare. There is an absence of any other primary disease, such as occlusive arterial disease.

Sympathectomy is the most effective treatment. One can expect almost 100 per cent relief in the lower extremities. In the upper extremities, because of the difficulty of sympathetic denervation due to anomalies of the nerves and other poorly understood reasons, the results are not so good. Ten to 15 per cent of the patients can expect complete and permanent relief, 50 per cent can expect partial relief, and the remaining 35 to 40 per cent can not expect any relief.[18] As surgeons learn how to denervate the upper extremity more effectively, they can expect better results.

Diffuse scleroderma is less likely to be associated with circulatory disturbances than are *acroscleroderma* and *sclerodactylia.* Sclerodactylia is limited to the extremities and is more likely to be associated with circulatory disturbances. If Raynaud's phenomenon is predominant, sympathectomy is indicated; otherwise, it will be of no avail.

The *pernio syndrome,* or acute or chronic chilblain, is a reaction of the peripheral blood vessels to cold, usually affecting women. It causes recurring erythematous and ulcerating lesions of the lower extremities. Remissions occur in the summer. Healing is associated with considerable pigmentation. Sympathectomy is beneficial in the cases in which the disease is severe.

Trench foot and *immersion foot* are caused not only by injury of the peripheral circulation but also by injury of tissue produced by exposure to cold and dampness together with a mild, usually sterile inflammatory reaction, and by trauma. Because of the injury of tissue, sympathectomy has not been beneficial.

After *frostbite,* the affected extremity may remain sensitive to cold for many months or even years, and in occasional instances chronic pernio or Raynaud's phenomenon may appear subsequently. Sympathectomy should not be carried out in the early stages because increased circulation might increase edema and produce a breakdown of tissue. If the disease progresses to chronic pernio or Raynaud's phenomenon, sympathectomy, of course, is indicated.

Livedo reticularis is a reddish-blue mottling and blotching of the extremities due to spastic narrowing of the arterioles and anoxic dilatation of the capillaries and venules. It affects much more peripherally situated vessels than does Raynaud's disease, which involves the large vessels of the digits and extremities. Livedo reticularis involves the vessels in the skin. In 30 per cent of the cases the disease is associated with hypertension.[19] In three of 13 cases reported by Barker, Hines and Craig, the disease process progressed to gangrene. Sympathectomy is indicated in cases in which the disease is severe.

Acrocyanosis is a disease which is similar to livedo reticularis. It is characterized by persistent coldness and cyanosis of the extremities. It is usually not severe enough to warrant sympathectomy, which, however, is effective if indicated.

Peripheral vascular disease of the occlusive type. There are certain major occlusive diseases of the peripheral circulation which, under certain circumstances, should be treated by operations on the sympathetic nervous system. One must remember that once gangrene is established, such operations will not save the involved extremity or digit.

The following criteria have been established as a basis for determining whether or not *arteriosclerotic occlusion*[18] should be treated by sympathectomy. The patient should be less than 60 years of age and should not have demonstrable coronary disease, ulcers or gangrene. The vasomotor response, an indication of associated vasospasm, should be good. Owing to improvements which have been made in the operative technic, we recently have become less rigid in the application of these criteria in selecting patients who are to be treated by sympathectomy at the Mayo Clinic. These improvements have reduced the mortality and the postoperative morbidity. As a result, it now is possible to perform sympathectomy in cases of more advanced arteriosclerosis in which the patients are more than 60 years of age. The results which we have obtained with this procedure in such cases have been most gratifying and we possibly have saved extremities which otherwise might have had to be amputated.

Thromboangiitis obliterans is a disease which is manifested by arterial obstruction, vasospasm and venous obstruction. It usually affects persons who are between 25 and 50 years of age. Allen, Barker and Hines [18] said that the youngest patient with this disease who has been

observed at the Mayo Clinic was 17 years of age. The disease occurs almost exclusively in males. According to these authors, 25 per cent of the patients with this disease who have been observed at the clinic have been Jews whereas only six per cent of all patients who come to the clinic are Jews. Most of the patients who have the disease are and have been heavy smokers, using an average of 20 or more cigarettes per day. Although nicotine is not believed to be a cause of the disease, it most certainly aggravates it, just as does exposure to cold. New lesions of superficial phlebitis or evidence of further arterial occlusion rarely is seen in cases in which the patients have stopped smoking.

The disease is usually bilateral but asymmetric. The progression of pallor, cyanosis and rubor, known as Raynaud's phenomenon, may occur. The arterial and venous circulation time is prolonged. Gangrene, ulcers, edema and superficial phlebitis are characteristic symptoms of thromboangiitis obliterans.

Sympathectomy increases the blood flow through an artery in a limb three or four times.[20] Because it abolishes sweating of the extremity it helps prevent excessive cooling of the limb. It is, however, of little benefit in the presence of gangrene or a poor vasomotor index. If, however, there is a good elevation of skin temperature following sympathetic paralysis, a good result may be expected from sympathectomy. According to Horton,[21] some type of amputation was performed in 15.6 per cent of all cases of thromboangiitis obliterans which were observed at the Mayo Clinic in the years 1917 to 1937 inclusive. Amputations of the foot, leg or hand comprised 71 per cent of the amputations which were performed for thromboangiitis obliterans from 1918 to 1927 inclusive, 63 per cent of those which were performed from 1928 to 1937 inclusive, and 48 per cent of those which were performed from 1933 to 1937 inclusive. It seems evident that since 1937 there has been a further decrease in the percentage of cases in which it has been necessary to amputate a foot, leg or hand. In general, lumbar sympathectomy should be performed bilaterally in cases of thromboangiitis obliterans. It rarely is contraindicated except in cases in which the disease is very mild or extremely severe. In the treatment of this disease, just as in the treatment of arteriosclerosis obliterans, it should be understood that sympathectomy does not remove the cause of the disease but produces improvement chiefly by increasing the circulation.

In cases of *sudden arterial occlusion* due to any disease, sympathectomy may be beneficial if the condition of the patient warrants its use. Our experience at the clinic indicates that the use of sympathectomy is not justified in cases of *thrombophlebitis.* This procedure, however, may be of value in cases of *surgical or traumatic occlusion* of major vessels of the extremities.

Painful conditions amenable to sympathectomy. Causalgia, which was described in 1864 by Mitchell, Morehouse and Keen,[22] is caused by injury of the large nerves and blood vessels of the extremities or by injury of adjacent structures. It is characterized clinically by burning pain and considerable hyperactivity of the sympathetic nerve supply of the extremity as manifested by color changes and excessive sweating. It can be cured by sympathectomy if recognized and treated promptly.

Visceral pain of chronic relapsing pancreatitis can be eliminated by section of the greater, lesser and least splanchnic nerves on one or both sides.[23] Whether or not this procedure will be effective in an individual case can be determined preoperatively by injecting a local anesthetic agent into the splanchnic nerves. Section of the splanchnic nerves has produced uniformly good results at the Mayo Clinic. These results are being reported by Craig.[24]

The burning pain of *phantom limb* [25] also has been relieved by sympathectomy. The other aspects of this syndrome, including the paresthesia and the sensation of the presence of the amputated limb, have not been relieved by sympathectomy.

As previously stated, cervicothoracic sympathectomy produces varying results in cases of *angina pectoris.* The best results, however, are obtained by sectioning the posterior roots of the upper four or five thoracic nerves.

Hypertension. In this country, Adson, Craig, Peet, and Crile [26] were the first surgeons to perform operations on the sympathetic nervous system for the relief of hypertension. Adson and Craig devised the infradiaphragmatic sympathectomy. Crile resected the celiac ganglion, and Peet devised a supradiaphragmatic operation. In the late 1930's, Smithwick used a combination of the procedures devised by Adson and Craig, and Peet. Many modifications of these surgical procedures are being used at present.

Wagener and Keith [27] proposed a system of correlating the changes in the ocular fundi with the severity of the disease. This system is used widely today, and is of considerable prognostic value. In malignant hypertension or hypertension, group 4, the characteristic findings are papilledema, hemorrhages and exudates, with sclerotic and spastic changes in the retinal arteries. Hypertension, group 3, is characterized by severe retinopathy without papilledema. In hypertension, group 1 and group 2, there are no hemorrhages, exudates or papilledema but only sclerosis and variation in the size of the retinal vessels.

At the clinic, it has been our experience in general that the better the appearance of the ocular fundi, the better the results of sympathectomy in cases of hypertension. There are other important criteria in selecting patients for this type of operation. The patient should be less than 50 years of age. The hypertension should be somewhat labile. There should be no history or evidence of congestive heart failure, renal failure or recent coronary occlusion. Increased intracranial pressure is a contraindication for surgical treatment. Progression of the disease is a strong indication for sympathectomy. Poppen and Lemmon [28] have expressed the opinion that the duration of the disease has little influence on the results, provided the patient meets the other requirements for sympathectomy. Enlargement of the heart is not necessarily a contraindication. Advanced arteriosclerosis or coarctation of the aorta is a contraindication. Angina

makes the prognosis unfavorable although we occasionally operate in cases in which it is present.

Careful urographic evaluation is important. The occasional presence of unilateral renal lesions may thus be ascertained, and nephrectomy can be performed. We are, however, inclined to perform sympathectomy simultaneously with nephrectomy in order doubly to assure ourselves of a good result and to avoid a second surgical procedure should the nephrectomy prove valueless.

It should be emphasized that only those patients whose disease has not been controlled by medical treatment be chosen for surgical treatment.

There is considerable controversy regarding the results of this type of operation. It is difficult to interpret and evaluate the results. This much can be said definitely. Anyone who has performed the operation in a large number of cases can cite numerous brilliant results. From October, 1946, until December, 1947, I performed extensive thoracolumbar sympathectomies of a modified Smithwick type in 35 cases of hypertension. In 23 of the 35 cases, information regarding the physical condition of the patients was obtained at least once during an interval of from six months to two-and-a-half years after the respective operations. In cases in which the patients or their family physicians reported that the blood pressure was normal, and in cases in which subsequent examination at the clinic disclosed that the blood pressure was normal, the result was classified as good. In cases in which the blood pressure occasionally was higher than normal but was normal on other occasions, the result was classified as fair. In the remaining cases, the result was classified as poor. In some of the cases in which the result was classified as poor, improvement has occurred in the appearance of the ocular fundi, the blood pressure has been lower than it had been before the operation and the patients have been free of symptoms of hypertension. On this basis, the results were as follows: good in eight cases, fair in five cases, and poor in ten cases. This is only an indication of the results of this extensive operation. In four of the ten cases in which the results were poor, the patients subsequently have died. I am recording these preliminary observations because the results seem to be similar to those reported by other authors. The operative mortality rate should be less than one per cent.

In 1947, Poppen and Lemmon [28] reported 100 cases in which extensive sympathectomy was performed. The results were as follows: good in 47 per cent, fair in 24 per cent, and unsatisfactory in 22 per cent of the cases. Grimson [29] reported that extensive sympathectomy produced good results in 38 per cent, fair results in 33 per cent, and unsatisfactory results in 14 per cent of 97 cases of hypertension. In both of these series of cases, 71 per cent of the patients were improved. It seems that, all other things being equal, the more extensive the procedure, the better the results. At the present time I am employing a procedure similar to that described by Poppen.

The extent of sympathectomy can be determined by sweating tests after the operation. The Adson-Craig

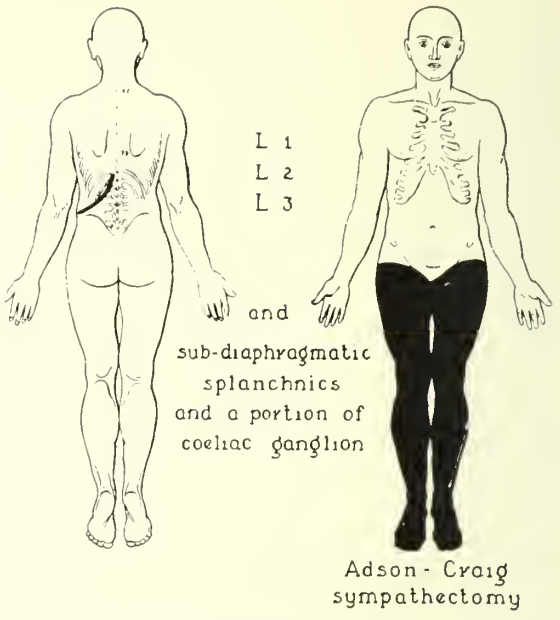


Fig. 7. Adson-Craig sympathectomy for hypertension; incision, extent of sympathectomy and area of anhidrosis.

infradiaphragmatic operation produces anhidrosis from the groin or knees downward (Fig. 7). The supradiaphragmatic and infradiaphragmatic operation of Smithwick produces anhidrosis from the umbilicus downward (Fig. 8). Thoracic sympathectomy (Fig. 9) produces varying degrees of anhidrosis of the abdomen and thorax, depending on the extent of the procedure. The Poppen operation, which removes the third thoracic to the third

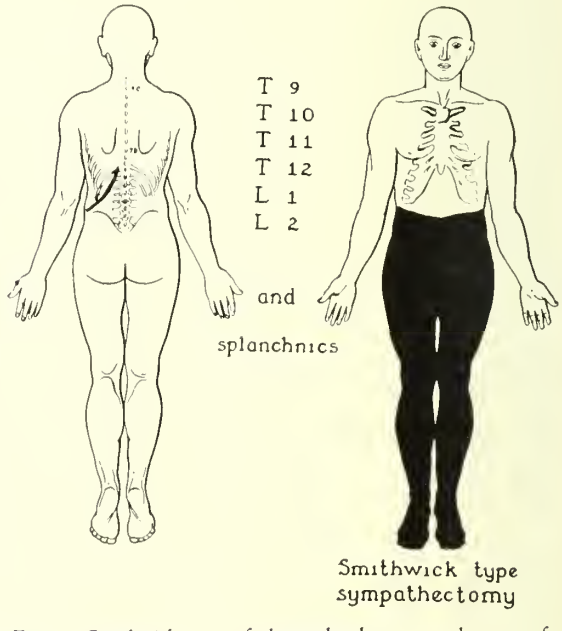


Fig. 8. Smithwick type of thoracolumbar sympathectomy for hypertension; incision, extent of sympathectomy and area of anhidrosis.

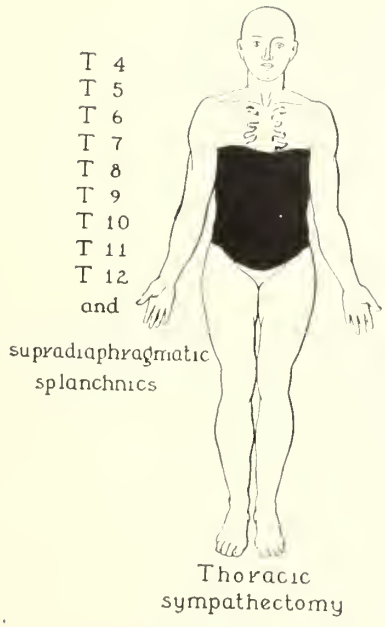


Fig. 9. Thoracic type of sympathectomy for hypertension; extent of sympathectomy and area of anhidrosis.

lumbar ganglia inclusive, produces anhidrosis over the entire body except the arms and head (Fig. 10). Total sympathectomy usually produces complete anhidrosis. In 1948, Ray and Console [30] described a phenomenon which we also observed in 30 per cent of cases in which extensive sympathectomy has been performed at the clinic (Fig. 11). This is a persistence or return of sweating in the anterior part of the thighs in a segment corresponding to the twelfth thoracic and the first three lumbar dermatomes. Ray and Console showed that this can be obliterated only by intraspinal removal of the anterior roots of the twelfth thoracic and the first two lumbar nerves. This graphically illustrates some of the aberrant patterns of the sympathetic system.

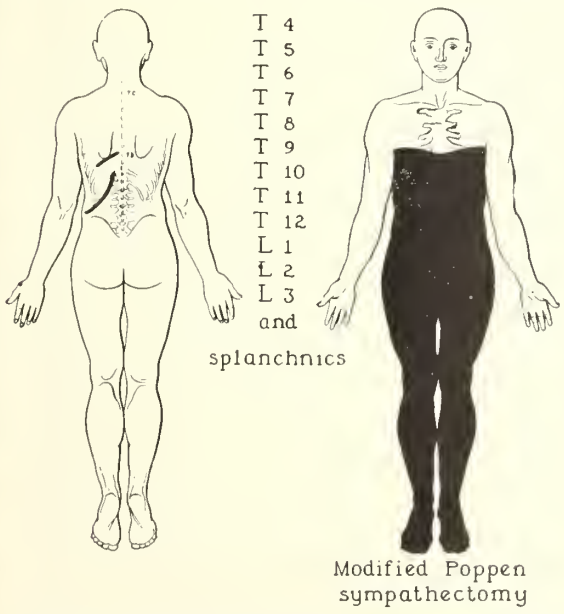


Fig. 10. Modified Poppen thoracolumbar sympathectomy for hypertension; modified incision, extent of sympathectomy and area of anhidrosis.

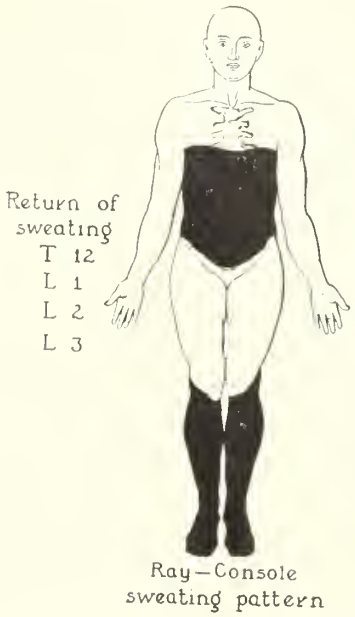


Fig. 11. Ray-Console anomalous sweating patterns following extensive sympathectomies with return of sweating in the area supplied by the twelfth thoracic to the third lumbar dermatomes inclusive.

Summary

For years, it has been known that operations on the sympathetic nervous system are of definite value in the treatment of vasospastic disease of the peripheral blood vessels and in the treatment of some occlusive diseases of the peripheral vessels. Recently it has become apparent that operations on the sympathetic nervous system also are of value in the treatment of causalgia, visceral pain and some aspects of phantom limb. They are of limited value in cases of angina pectoris.

Operations on the sympathetic nervous system are an aid in the treatment of hypertension in cases in which medical therapy has failed. They are of particular value in the treatment of progressive hypertension before the malignant phase has been reached.

I would like to emphasize that the use of the word "cure" has been carefully avoided in this paper and that it should be used only as medical science proceeds beyond its present stage.

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TUBERCULOSIS RESEARCH

Of nearly $7,000,000 spent for tuberculosis research in the United States in a twelve-months' period during 1947-1948, about two-thirds was expended for the study of drugs in tuberculosis treatment. Total allocations for tuberculosis research in the period covered came to $6,710,141, of which $4,388,039 was spent on chemotherapy studies, mostly as the result of intensive research on streptomycin and other chemotherapeutic agents in tuberculosis treatment. The survey showed that the greatest expenditure on tuberculosis research was by official agencies, principally federal, with a total of $3,814,050, of which $3,073,200 was allocated to chemotherapy investigations.

Treatment of Rheumatic Diseases with Glucuronic Acid*

A Preliminary Report

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The rheumatic diseases have presented a continuous challenge throughout the history of medicine. Every medical advance and discovery has been applied to their treatment without furnishing a definitive cure, finding the causes, or exposing the true nature and course of this disease group. To quote a most recent example, the excellent reports on Compound E, highly promising as they are, state plainly that the success lasts only as long as the treatment is continued. In a rather similar problem, we cannot call insulin the definitive treatment of diabetes mellitus, yet we appreciate its value as a controlling factor. Just as in diabetes mellitus, a complete solution of the rheumatic problem has still not been given. Undoubtedly, some of these questions will be answered as experience with Compound E develops. But until now, we seemed to have reached an impasse both in the etiological approach and the mode of treatment.

It therefore seemed promising to attempt a long neglected approach—a treatment along physiological lines in which we tried to replace the deficiency encountered in certain of these diseases in an effort to restore normal body functions. Such a substance is glucuronic acid, which works as a detoxifying agent and also enters into the formation of collagen. In rheumatic and related diseases it is deficient, and the response to its administration has been encouraging enough to warrant its further trial in various manifestations and stages of this disease group.

Biochemists have long known that glucuronic acid or its salts appear as conjugate substances with various toxins and putrefactive substances and are excreted in the urine as such. Utilization of the acid in the body has been difficult to study and is mentioned infrequently in the literature, due possibly to the scarcity of the product and the expensive and elaborate manufacturing process. Its clinical use and study is comparatively recent. Glucuronic acid was first mentioned in medical literature in 1878 by Jaffe[1] and subsequently by Schmiedeberg and Meyer.[2] At the turn of the century it was demonstrated that glucuronic acid was present in the urine and blood of man and cattle.[3,4] Shortly afterwards, Cammidge[5] reported increased glucuronic acid in the urine of patients with pneumonia, chronic bronchitis, measles, scarlet fever, smallpox, and pancreatic diseases.

Subsequently, it was found that glucuronic acid did not exist in a free state in the urine, but was conjugated with various substances, including toxins and metabolic products. This demonstrated the body's utilization of the acid as a detoxifying agent. Substances such as sulfonamides, chloral hydrate, phenol, antipyrin, and a great many other chemical substances, when introduced into the body, were finally excreted as conjugated glucuronic acid compounds. In addition, various aromatic compounds which resulted from putrefactive changes in proteins, e. g., indole and skatole, found in the intestines, were also excreted in this way. Glucuronic acid excretion appeared to increase in certain conditions such as jaundice, diabetes mellitus, bone diseases, and extensive traumatism to the muscles. Deficiencies of most vitamins, with the exception of riboflavin, produce a decreased excretion of the acid.

Glucuronic acid is a six-carbon chain compound and usually exists as a bound compound or glucoside which can be split by acid hydrolysis. It is formed from carbohydrate stores in the human body and when these are depleted, it may also be derived from glucogenic amino acids. Possibly the liver and muscles are involved in its manufacture and storage.

In spite of the early experimental and biochemical studies in the latter part of the 19th century, no new work appeared in literature until the late twenties when Ambrose,[6] Sherwin,[7] and Quick[8] again stimulated interest in the study and clinical application of glucuronic acid. Few additional biochemical studies[9] were done during the following years, but in December, 1947, Peterman[10] published an excellent paper giving the results of his study in the toxicity, utilization, and some clinical application of glucuronic acid in arthritis, which suggested its use in various other nutritional and toxic diseases. Its theoretical possibilities in the collagen disease group, as well as in barbiturate, morphine and sulfa poisoning, toxemia, liver diseases, diabetes mellitus, general debilitation and various allergic states, bear further investigation.

No matter whether we assume the rheumatic diseases to be a generalized toxicity, a nutritional deficiency, a defective collagen cement substance, or a combination of these, as long as glucuronic acid fits all these concepts, it seems logical and reasonable to apply it for the treatment of this disease group.

When glucuronic acid or its salts are ingested, some will appear as conjugated phenols or some may appear in the free state in the urine if the ingestion is massive. It plays an important role as a detoxifying agent in the

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body, and is utilized for the conjugation of aromatic acids, phenols, and tertiary alcohols. The excretion of glucuronic acid will be increased with the administration of a variety of substances with which it combines as a detoxicant and with which it appears in the urine, such as menthol, morphine, certain sulfonamides, indole, skatole, steroids (estrogenic hormones), and possibly certain carcinogenic substances.

Glucuronic acid is an essential constituent of the fibrous tissue of the body, particularly the cartilage, fascia, periosteum, nerve sheath, joint capsule, tendon and joint fluid. The intercellular cement substance and blood vessel walls [10] are also composed in part of this substance. The importance of these tissues is of increasing interest to rheumatologists because of the recent stress on collagen diseases.

In the study of roentgen treatment of Marie-Strümpell arthritis, Dr. Harry C. Blair [12] made some interesting observations on the chemistry and metabolism of cartilage and allied tissue involving glucuronic acid. Cartilage and mucin contain chondroitin sulphuric acid and mucoitin sulphuric acid respectively, both of which are composed chiefly of glucuronic acid combined with sulphur. Sulphur, used empirically for 2500 years in the treatment of arthritis, has recently been found ineffective by many experimentors.[14] The other component, glucuronic acid, has remained unexplored and untested. Peterman [10] suggests that the destruction of cartilage and bone may be due to deficiency of the glucuronic acid required for body metabolism. No attempt is made here to argue the cause of the destruction, whether it be toxic, bacterial, allergic, or endocrine in nature. It is possible that the same underlying metabolic disturbance may be involved in the cement substance of the collagen diseases. It remains for further investigation to determine or disprove this more fully.

In the opinion of Bauer [13] and many other investigators, general body nutrition and hygiene are, at present, the paramount therapeutic factor in rheumatic diseases. Of particular interest in Peterman's study was the general feeling of well-being, the increase of appetite, and gain of weight in his trial subjects. This has been borne out by our own observation. It is known that most vitamin deficiencies produce a decrease in glucuronic acid excretion. Possibly the deficiency of glucuronic acid may be a factor in the lack of utilization and metabolism of the various vitamins. There appears to be some relationship, but this too, at present, remains an unsolved problem.

Clinical Observation

A total of 50 cases of rheumatic diseases were treated with the object of determining what types could best be treated with glucuronic acid. They were therefore not especially selected, but studied as they presented themselves. The results are summarized as follows:

Our cases, consisting of 15 men and 35 women from 17 to 70 years of age, were observed and followed for a period of six months to a year. The main types, as to be expected, were osteoarthritis and rheumatoid arthritis. There were 17 cases of osteoarthritis and four mixed types, which in accordance with the recommendations of the American Rheumatism Association are classified in the rheumatoid group.[14] The remainder of the cases were sub-classified where recognizable as: two cases of shoulder-hand syndrome; two, Marie-Strümpell type; two post-rheumatic fever joints; one infectious arthritis; one palindromic arthritis; and two gout. In addition, there were: one case associated with bursitis, and five associated with sciatica, not included in the arthritis group.

Blood counts, sedimentation rates, and x-rays were taken in order to confirm the diagnosis, to define the stage of the disease, and to follow the progress whenever possible. Clinical observation and the patient's subjective response were closely correlated to objective findings, such as decrease of swelling, redness, improvement of flexibility, and freedom of affected joints. The therapeutic results were evaluated in accordance with the criteria of the American Rheumatism Association.[15]

Three preparations were used: syrup containing 5 grains per drachm, and capsules and tablets with 7½ grains (500 milligrams) each of Glucuronolactone.* In equivalent doses these preparations were used interchangeably. The dose given in our series averaged 10 to 15 grains three or four times a day. In two cases, total daily doses up to 150 grains (10 grams) were taken without untoward effect. Treatment was maintained from one week to one year, with two months as the average duration. Medication was discontinued when the patient's symptoms remained stationary or showed no further improvement. In several instances, the treatment has been maintained continuously for one year because the patient's symptoms flared up after one or two weeks' cessation of treatment and subsided promptly on resumption of glucuronic acid treatment. Up to now, there have been no exacerbations during therapy.

More recently, we have been using a 10 per cent buffered solution of glucuronic acid made for injection. We have not as yet sufficient experience to include the cases of this series in our present report.

Undesirable side effects were noted in three cases, one with flushing of the face, another with diarrhea, and a third with gastric upset which promptly abated on reduction of dosage or discontinuance of the drug. Follow-up urinalysis showed no kidney damage after glucuronic acid therapy; only one case had a trace of albumin, and there the microscopic findings were normal.

Since our cases were unselected, most had been previously treated by various other forms of therapy, including salicylates, succinate, bee-sting therapy, gold, non-specific proteins, typhoid and rheumatic-streptococcus vaccines, high vitamin doses of the B, C, or D groups. In addition, some received various local applications; physical therapy; treatment by change of climate, hygienic measures, removal of foci such as infected teeth and tonsils, and last, but not least, by nutritional meas-

*Supplied through the courtesy of Commercial Solvents Corporation.

ures alone. We have, therefore, a fair basis of comparison with other methods of treatment. More than one-half of our patients have run the gamut of all these treatments with no appreciable results.

Evaluation of Therapy in Specific Types

Osteo-arthritis. The cases in our series that responded best were the comparatively early cases of osteo-arthritis, especially those in which this disease was less than one year in duration. Those of longer duration responded less dramatically, but in almost all of this type there was some subjective improvement even though x-ray findings remained essentially unchanged. In addition to the lessening of pain and swelling in the joints, the general feeling of well-being and the gain of weight were outstanding symptoms. In a few cases, this improvement was maintained even after therapy had been discontinued. Glucuronic acid was of special value in cases of osteo-arthritis associated with Heberden's nodes, at times actually causing diminishing in size of the involved joints. This has also been observed by other investigators.[11]

Mixed types. In the four cases of mixed arthritis there was considerable improvement; not as marked as in the former group, but found to be of some therapeutic value. Here, too, the duration of the disease seemed to have a bearing on the effect of the therapeutic response.

Rheumatoid arthritis. In the rheumatoid group and its various subdivisions, the results were less effective and at times equivocal. Clinical improvement of varying degrees occurred in almost half of the cases. This improvement did not necessarily correspond to a fall in the sedimentation rate, and usually stopped when the medication was ended. Two of our cases were associated with post-encephalitis syndromes, one of which was a true Parkinsonian type. Both of these cases showed improvement in this condition as well as a diminished tremor and an increased use of hands. Our treatment of shoulder-hand syndrome achieved mixed results: one case responded very well, the other failed. The two cases of Marie-Strümpell disease under our observation also showed a mixed response.

Two cases with post-rheumatic fever joints, whose attacks were of recent etiology, responded very well. The result in the case with bursitis was questionable, while those associated with sciatica showed very satisfactory results. In fact, both from our observations and those of other investigators, this appears to be the most promising field for the use of glucuronic acid. To date, we have ten additional cases (not included in this report) which showed dramatic response to this treatment.[12] Two of our cases of sciatica were definitely associated with arthritis; one was radicular in type. Two cases of gout responded well to treatment. Many more cases should be observed before a definite conclusion can be reached. These were both early cases and spontaneous cures at this stage are not uncommon.

Infectious, as well as palindromic arthritis, is usually shortlived and leaves no permanent effects so that the response to any treatment again cannot be exactly evaluated. Peterman reported excellent results with the treatment of fibrositis. Since we had no cases of this type in this series we can give no results on this condition, but indications are that glucuronic acid may be of some value here, and should be investigated further.

An interesting observation, and not reported in our series, was the effective treatment of an arthritis case of only a few days' duration accompanied by swollen joints following a diffuse ecchymotous rash—the allergic sequellae of penicillin treatment. These joint involvements are being seen quite commonly by dermatologists as an accompaniment to the various allergic states of different etiology. The association of allergy and arthralgia has given rise to the theory that many of our real arthritides may be serous-membrane responses to allergic reactions, possibly of the anti-body-toxic type. At times, the joint symptoms associated with an urticarial rash may prove quite troublesome and persist beyond the original manifestations of allergy. Here too, glucuronic acid may be of value in treatment.

Two of our cases of arthritis (one of which was a possible Kimmelstein-Wilson type) were associated with diabetes mellitus. Under treatment, the joint symptoms receded and the diabetes, too, showed signs of improvement. Somewhat less insulin was required in both cases for proper control of the disease. No definite conclusion can be drawn from these two cases since many other substances can influence the diabetic state, such as large doses of vitamin B, E, liver extracts or estrogens. There have been no actual control studies on the effect of glucuronic acid in diabetes. A few cases showed a false positive sugar reaction in the urine due to glucuronic acid administration. This should be watched for and evaluated.

Discussion

The results obtained in the preliminary survey justify our belief that glucuronic acid has a definite place in the treatment of rheumatic diseases. Certainly our results were comparable to, and sometimes better than, those obtained with the standard methods of therapy. The dosage of glucuronic acid will have to be regulated further. Perhaps the method of administration may have to be modified after absorption and excretion have been more fully studied. We do not believe that this is the long awaited panacea in the treatment of arthritis. Most assuredly, the treatment with glucuronic acid, in our opinion, is more logical and physiological than any of the previously used drugs. It does not have the dangers of toxicity of either gold or high-vitamin D therapy and combines the detoxifying faculty with a blood vessel building nutrient material. This is obviously more than a symptomatic treatment and deserves wider application and trial. With the exception of sciatica, where the relief was usually dramatic and prompt, glucuronic acid does not appear to have the analgesic effect of salicylates, and may have to be supplemented with codeine or salicylates in the initial phase of the disease where symptomatic relief of pain is the most urgent problem.

The difficulties in evaluating therapy of rheumatic diseases are well appreciated. In an attempt to set up more specific criteria in this heretofore vague field, the American Rheumatism Association has defined standards and issued score cards in an attempt to make an accurate

comparison for types of therapy. A large number of cases, accurate control, and detailed laboratory studies are essential, but it is difficult to achieve this with the rheumatic patient who can neither be hospitalized nor followed up for a sufficient length of time for detailed comparison. Many more cases will need to be studied, and further laboratory work be done, before this or any type of therapy can be properly evaluated. This report is essentially clinical. We hope to extend our observations and studies in subsequent reports.

In keeping with the therapeutic score cards,[16] our results were graded by the four degrees:

1. Complete remission
2. Major improvement
3. Minor improvement
4. Unimproved or worse

With evaluation of our 50 cases, 9 showed complete remission, 19 showed major improvement, 14 minor improvement, while 8 cases remained unimproved or became worse.

TABLE I

Type of Arthritis	Number of Cases	Complete Remission	Major Improvement	Minor Improvement	Unimproved or Worse
I					
Rheumatoid groups	14	1	4	5	4
Mixed	4		2	1	1
Shoulder-hand syndrome	2		1		1
Marie-Strümpell type	2		1	1	
II					
Osteoarthritis	16	2	6	6	2
III					
Special types:					
Post-rheumatic fever joints	2		2		
Infectious arthritis	1		1		
Palindromic	1		1		
Bursitis	1				
Sciatica	5	4	1		
Gout	2	2			

Most other therapeutic procedures, properly evaluated, give about 50 per cent in the improved groups, with the failures running about 25 to 35 per cent. The comparison of our results with others previously published shows that we have done as well as many, possibly somewhat better. In selected forms, such as sciatica, gout and early osteo-arthritis, the results are promising, and because of the absence of toxic effects, should be given a further trial. This substance may point the way to a better understanding and more successful therapy in the future.

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AIR POLLUTION CONFIRMED

Continuing pollution of air in present-day industrial communities not only can cause death, as it did last year at Donora, Pennsylvania, where 20 persons died during a prolonged smog, but it has other grave health implications, Federal Security Administrator Oscar R. Ewing declared. In addition to the 20 deaths, the illness of 5,910 persons—43 per cent of the population—was caused by the smog which hung over Donora and the nearby community of Webster for five days beginning October 27, 1948.

Headache and Headache Pain*

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Headache and head pain are quite common in a variety of diseases. The otolaryngologist and the ophthalmologist are frequently the first consulted by the patient or referred to by the general practitioner, due to the exaggerated belief that refractive error and sinusitis constitute the primary cause of headache in a majority of cases. These two conditions account for only a small percentage of headaches as compared to other more frequent causes. Chronic sinusitis in particular, when unassociated with pain-causing factors, is rarely, if ever, the cause of headache.

To the EENT specialist falls the responsibility of identifying the type of headache experienced by the patient and of ruling out any EENT pathology that can be the etiological factor. If other causes are responsible, he must identify the cause and refer the patient to his doctor with specific recommendations as to the treatment.

Mechanism of headache. After a tremendous amount of experimental and clinical research within the last decade, our concept of the mechanism of headache and the factors involved has changed and many of the previous theories have been discarded or modified.

Headache and head pain are divided into two main divisions—intracranial causes and extracranial causes, which are further subdivided into vascular and neuralgic.

The pain-sensitive structures within the cranium are the venous sinuses and their tributaries, the dural arteries, the cerebral arteries of the base of the skull (circle of Willis), and the dura of the base of the brain.

The non-sensitive structures are the cranium, the brain proper, the dura, except the dura of the base, and the pia, the lining of the ventricles, and the choroid plexus.[1,a]

Headache or pain may be caused by any or a combination of the following factors:[1,b] (1) dilatation and distension of intracranial arteries, (2) traction on the veins and venous sinuses with displacement, (3) traction of the middle meningeal arteries and arteries of the base of the brain, (4) inflammation in or about any of the pain-sensitive structures of the head, (5) direct pressure by growth of tumors on the nerves.

Extracranial sensitive structure.[1,c] The skin, the muscles especially around the arteries, the gala, and the arteries are all sensitive to pain; the veins are less sensitive. The nonsensitive areas are the bone with its diploic and emissary veins, the periosteum, except where it attaches to the gala at the brows, the temple, and the occipital region.

Intracranial pressure changes result in a bilateral diffuse headache, but the intensity of the headache is not directly proportionate to the increase or decrease of the pressure. The cause of the headache is not the change of pressure but the displacement and distortion of the pain-sensitive structures within the cranium, especially the arteries at the base of the brain. The post-lumbar puncture headache is due to a decreased cerebrospinal fluid pressure by a removal of a large quantity of fluid or a gradual leakage of fluid from the puncture of the dura after the lumbar puncture.[1,d]

Brain tumors. Headache caused by brain tumors and other space-occupying lesions is a deep, aching, steady, dull, non-throbbing pain. Brain tumors are divided clinically into supratentorial and infratentorial.

In supratentorial tumors, the headache is referred to an area on the cranium externally, anterior to a line drawn across the vertex from ear to ear, and the pain is referred through branches of the fifth nerve. If the tumor is growing slowly, there may be no headache at all. Headache starts unilaterally on the side of the tumor and stays so until papilledema develops. In the latter case the pain would be radiated to the occipital region and would usually become generalized by the increased intracranial pressure.

In infratentorial tumors, the headache is referred to the occipital region and the posterior aspect of the neck through the ninth, tenth, and upper cervical nerves. The headache starts occipitally but soon becomes generalized and is referred to the temporal and frontal area by virtue of the early increased intracranial pressure. Thus, there is no localizing importance to the headaches caused by these tumors. In fact, any time the intracranial pressure is increased, as shown by papilledema, the headache becomes generalized or is referred elsewhere. Jolting of the head in patients with increased intracranial pressure may exaggerate the pain in a special location in the head. This is a localizing point and shows the site of the tumor.

Subdural hematoma. This type of lesion has been more and more recognized and operated on with success. Headache is the main symptom and is found in 70 per cent of the cases. Subdural hematoma is caused by a rupture of a tributary vein to one of the venous sinuses of the cranium by a trauma to the head.[2] The trauma may be minimal or insignificant and forgotten by the patient, especially in the chronic incapsulated type.[3] The headache starts a few days after the accident or trauma, and the severity increases progressively during the first six to eight weeks, after which it remains stationary unless relieved by surgery. The pain is dull, diffuse, like a brain tumor pain, and is localized to the side of the hematoma early, but generalized later on, or it may be generalized from the onset. The spinal fluid is xanthochromic early in the course. Encephalograms and ventriculography confirm the diagnosis.

The following case history shows a typical course of

*Presented before the North Dakota State Medical Meeting, Minot, North Dakota, May 17, 1949.

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a subdural hematoma. A 46-year-old mail carrier was first seen on May 3, 1948, complaining of a severe, continuous, pulsating, diffuse headache for two months. The onset followed a jolt caused by falling on his back while trying to crank a car. The symptoms increased in severity until he was completely incapacitated. The spinal fluid examination showed normal pressure and dynamics, proteins 22 mg. per cent, no cells, and no xanthochromia. An x-ray showed a displacement of a calcified pineal body to the left, indicating a space-occupying lesion on the right. The patient was referred to the Mayo Clinic, where he was kept under observation for two weeks in the neurological department. His symptoms improved slightly on bed rest but he showed no neurological findings until two weeks after admission, when he experienced severe vertigo, nausea, vomiting, and headache. A craniotomy was performed and a large subdural hematoma was found covering the entire parietal lobe on the right side and extending to the frontal and temporal lobes. It was incapsulated and was removed in toto. This patient has been active and in good health since the operation.

Subarachnoid hemorrhage. This condition is caused by a rupture of a congenital aneurysm at the base of the brain without any precipitating trauma or accident.[4] Arteriosclerosis and pre-existent periodic headaches, like migraine, are predisposing factors. Onset is usually in the fourth decade. It starts with a dramatic and excruciating pain in the occipital area described by the patient as something that snaps in the head. There is vomiting, drowsiness, and neck rigidity, sometimes followed by convulsions and coma.[1,e] Thirty-three per cent die in the first week. There may be a recurrence within a year but prognosis is good for survival after one year. The headache increases in severity for two weeks and usually disappears completely within two months. It is important to diagnose this condition, as surgery and ligation of the aneurysm can save many patients. Site of the aneurysm can be demonstrated by arteriograms. (See Table I.)

TABLE I

Headache	*Subdural Hematoma*	*Subarachnoid Hemorrhage*
Age	Any age	Commonest in 4th decade
Cause	Trauma—rupture of vein	No trauma—rupture of congenital aneurysm
Onset	After lapse of few days	Sudden dramatic
Course	Increase of headache up to 8 weeks—then steady	Maximum in 2 wks., disappears in 8 wks.
Associated Symptoms	Few	Many, with cranial N. Paralysis and pressure symptoms
Recurrence	Rare	Usually recurs
Site	Frontal—rarely occipital	Mostly occipital
C.S.F.	Xanthochromic	Hemorrhagic

Headache due to generalized dilatation of intracranial arteries. Generalized dilatation of the intracranial arteries resulting from a variety of conditions causes an intense, generalized, diffuse, pulsating headache. The headache is temporarily relieved by pressure on the arterial carotid which decreases the blood flow, or by pressure on the jugular which increases the cerebrospinal fluid pressure, thus supporting the walls of the arteries externally and preventing their maximum dilatation and decreasing the amplitude of pulsations.

The following types of headaches fall under this category: (1) headache induced by intravenous histamine injections which appears within a minute of the start of the injection of 0.1 to 0.2 mg. of histamine; (2) caffeine withdrawal headache in those who stop taking coffee after indulging for a time; (3) anoxemia of any cause such as carbon monoxide poisoning, high altitude, congestive diseases, etc., by the direct action of the decreased oxygen tension on the vasomotor centers; (4) fevers; (5) alcoholic hang-overs; (6) nitrite headache where nitrite is absorbed over a long period of time medicinally or in industry; (7) constipation headache through a reflex dilatation of the intracranial arteries caused by distension of the rectum.[1,f]

Headaches of extracranial origin:

Temporal arteritis headache. Dilatation of any artery causes pain, while constriction of the arteries causes no pain. Pain caused by inflammation of the temporal arteries gives a characteristic picture and is discussed separately. The cause is an inflammation of the temporal artery, usually unilateral, resulting from a subacute focus of infection somewhere in the body. Onset is acute, affects older people from the sixth to eighth decade, is accompanied by a mild fever, malaise, leukocytosis, and other symptoms and signs of infection. There is a severe, steady, throbbing pain, unilateral, and localized to the distribution of the temporal artery. The artery is tender to palpation and seems distended and tortuous. The disease is self-limited and subsides in a few months. Novocaine injection around the artery relieves the pain temporarily and is diagnostic. If the symptoms are severe enough, sectioning of the artery would relieve all symptoms.[1,g]

Hypertensive headaches. The characteristics of a so-called hypertensive headache are a bilateral, dull, throbbing, frontal and temporal headache that appears every morning on awakening and improves quickly as the patient moves about, especially after breakfast. The cause of the headache is dilatation of the external carotid arteries and their branches, and also the dural arteries to a lesser extent.[1,h] It is not caused by dilatation of cerebral arteries, however, as experimentally this headache is not relieved by the usual means that relieve dilatation of cerebral arteries. Although this headache is associated with hypertensive disease, it is not proportional to the degree of hypertension and its severity is not greatly influenced by the variation of the tension.[1,h] The onset, however, is always related to an increase in blood pressure. This headache should not be confused with the headache of hypertensive encephalopathy of

malignant hypertension with renal failure where the headache is continuous, severe, and is relieved by hypertonic intravenous glucose. The etiology of the latter is edema of the brain.[1,i]

Patients improve on regulation of their activities, general treatment of hypertension, and raising the posters of the head of the bed by a block of wood which tends to decongest and possibly prevent dilatation of the carotid arteries during sleep. Moench believes that potassium thiocyanate is the most effective of the hypotensive drugs to control the hypertensive headache with a variable dose of 65 to 200 mg. daily and blood level of 5 to 8 mg.[5]

Migraine. This is a very prevalent headache and has been studied extensively. Eight per cent of all patients seem to have it to a variable degree. Migraine has a characteristic group of symptoms and signs that are easy to recognize. The characteristics are the following: It is a vascular, throbbing, periodic headache with a variable period of complete relief between attacks. It starts with an aura in 10 per cent of cases, followed by a rapidly progressive headache. It is unilateral at onset, may become generalized, and is associated with irritability, depression, nausea, and vomiting, constipation or diarrhea, and polyuria. The duration of the attack varies from a few hours to many days with complete relief of headache between attacks. The attack characteristically starts in the early hours of the morning. The aura may be visual in type of bright flashes, moving scotoma, photophobia, or emotional with euphoria, hyperesthesia, or auditory hallucination. The aura is caused by a vasoconstriction of the intracranial cerebral arteries.[1,j]

The migraine attack is caused by a vasodilation of the branches of the external carotid arteries. The dural and cerebral arteries participate to a minor degree. Migraine is more than just a dilatation of the external carotids as shown by the many associated symptoms such as nausea, polyuria, vasomotor responses. It has a hereditary tendency in 60 per cent of cases and psychological, mental, and emotional states have a great deal to do with its occurrence. Its relation to menses is not merely coincidental as it is caused by an excess of gonadotropins of the pituitary. Follicular ovarian extracts inhibit the formation of gonadotropins and help in controlling migraine related to menstruation.[6] Its relation to allergy from food is possible but not too common.

Any vasoconstrictor that can decrease the amplitude of pulsation by 50 per cent will relieve the headache provided it is given early enough in the attack.[1,k] The reason for non-effectiveness of vasoconstrictors late in the attack is due to the edema of the vessel wall which will resist vasoconstriction of the drugs.

Ergotamine tartrate (Gynergen) .5 mg. intramuscularly or intravenously is the best drug to cut short the attack. Relief comes within forty-five minutes to one hour. It acts directly on the smooth muscles of the vessels and not as an antagonist to the sympathetics. Relief occurs in 90 per cent of the cases. It should not be repeated within seven days. Ergotamine may be given by mouth to those patients who do not have nausea or vomiting early in the attack, and it is more effective and less nauseating if the pills are crushed and put under the tongue. The dose is 5 mg. by mouth and 3 mg. under the tongue as one dose, followed by 2 mg. every half hour to one hour if no relief occurs. Maximum dose is 10 mg.

Dehydroergotamine tartrate (DHE 45)[7] is better tolerated with less nausea and less uterine effect. Conflicting reports about its results have been reported but apparently it has not been used in large enough doses. One mg. may not be enough and 2 mg. in one dose may give better results.

Caffergone, "Sandoz", is a combination of caffeine 100 mg. and ergotamine 1 mg. with a synergic action between the two vasoconstrictors. The dose is two tablets at onset of the headache and one every thirty minutes for two or three times until relief is obtained.[8]

Follicular extract is given before the menstrual period to those patients where the migraine is associated with menstruation.[6]

Histamine 2.75 mg. as infusion with 500 cc. of saline in glucose given intravenously may relieve the attack by lowering the blood pressure, but its effect is unpredictable as histamine dilates the arteries. A test for migraine, as used by Schnitker,[9] is to give the patient 1/50 of a grain of nitroglycerine sublingually. A reproduction of a mild attack results within thirty minutes. Butler and Thomas [10] believe migraine is due to a lower tolerance to histamine and intravenous histamine infusions increase tolerance to it. This has been successfully tried in quite a number of cases to ameliorate or prevent recurrence of attacks.

Histamine cephalalgia. This type of vascular headache has been studied by Dr. Horton [11] of the Mayo Clinic. It has many similarities to migraine and to Sluder's sphenopalatine ganglion syndrome and differs from these in some aspects. Like migraine, it is caused by dilatation of the external carotid artery. Onset is in the fourth or fifth decade, frequently preceded by migraine in earlier years. It is a sharp, throbbing, acute pain. The attack starts after retiring to bed or in the early morning hours and lasts a very short time, only one to two hours. It recurs almost daily with periods of relapses. It is accompanied by vasomotor symptoms such as heat sensations, sweating, lacrimation, rhinorrhea, and blockage of the nose. It is unilateral and frequently starts in the forehead and temple with the occipital region frequently involved. The primary etiological cause of this headache is a lowered tolerance to histamine. A cold stimulus will liberate histamine locally and start the dilatation of the external carotid artery or its branches.

Atkinson [12] believes that skin tests are positive in histamine-sensitive patients; 0.05 cc. (0.01 mg.) of histamine dihydrochloride is used. A wheel of more than ½ inch and a flare of more than 2 to 2½ inches in diameter with persistence of reaction of more than twenty minutes is positive. Presence of pseudopodia is very significant. For the subcutaneous test, Horton [11] injects .35 mg. subcutaneously. The test is positive if a headache is repro-

duced within a short time. For the intravenous test, Moench uses .1 to .2 mg. of histamine acid phosphate intravenously. A typical headache is reproduced in thirty to forty-five minutes, which is not to be confused with the immediate histamine headache caused by the intravenous injection that would be diffuse and would last a few minutes in normal individuals.

Patients do well on desensitization. The term desensitization is a misnomer as histamine is not antigenic. Histamine therapy may increase the body tolerance to histamine, stimulate histaminase, or alter the vasomotor lability.[13] The following technique, as used by Horton,[11] has been used by us with good results. Starting with .15 cc. of histamine acid phosphate (0.275 mg. in 1 cc.), the dose is increased by .05 cc. until a maximum dose of 1 cc. is reached. These injections are given twice daily, and after twenty injections, a maintenance dose of the maximum tolerated by the patient is given twice weekly or less often, as needed. A quicker and probably a better way of desensitization is through histamine intravenous infusions; 2.75 mg. of histamine acid phosphate dissolved in 500 cc. of glucose or saline is given intravenously. The rate of the infusion depends upon the reaction of the patient. This can be repeated every other day for five doses, or daily if well tolerated.

Here is a typical case for an illustration. A 45-year-old man was seen two years ago for headache of ten years duration with all the typical signs of a histamine headache. The attacks recurred daily and started on awakening or would wake the patient in the middle of the night. He was histamine positive by a skin test and an attack of pain was reproduced by an intravenous test. He was given a course of histamine subcutaneously and has had no recurrence since, in a period of two years of observation.

Histamine desensitization subcutaneously was successful in the following case of migraine. Mrs. F., 42 years of age, had headaches for the last thirty years with periodic attacks, typical of migraine. She had the histamine subcutaneous course with complete cure. This patient needs, however, a maintenance dose once a month to keep her asymptomatic. In our experience about 50 per cent of migraine cases are improved or greatly improved with histamine desensitization. (See Table II.)

TABLE II

	Migraine	*Histamine Cephalalgia*
Pathogenesis	Dilation of external arteries	Same
Family History	Present	Absent (may be preceded by history of migraine)
Age	Adolescence	Fourth to sixth decade
Aura	Present	Absent
Duration	Many hours or days	1 to 2 hours
Onset	Early morning	During night or on awakening
Periodicity	A week or more between attacks	Daily, with remissions
Type	Pulsating, unilateral, may become bilateral	Pulsating, unilateral
Associated Symptoms	Nausea, vomiting, polyuria, mental apprehension, photophobia	No nausea or vomiting. Lacrimation, nasal obstruction, swelling of parts affected
Tests	Nitroglycerin	Histamine
Treatment	Vasoconstrictors, histamine desensitization	Vasoconstrictors (attack too short for action) histamine desensitization

Referred Headache:

Nose and sinuses. The sensitive parts of the nose and the sinuses vary at different sites.[1,1] The ostia of the maxillary and frontal sinuses are extremely sensitive while the mucous membrane of the sinuses proper are very slightly so, except with acute purulent inflammation. The septum and the vestibule are sensitive to pain. The pain is projected along the branches of the sphenopalatine ganglia and the ethmoid nerve of the ophthalmic.

Acute sinusitis: This causes headache and pain and is easily diagnosed by the associated tenderness and purulent discharge. In the absence of acute sinusitis, pressure by a deviated septum or hypertrophic turbinates causes referred pain and headache. Cocainization of the pressure area relieves the pain and surgery removes it permanently.

Maxillary sinuses: Headache originating in the maxillary sinus starts in late morning and is relieved by evening. The pain is usually referred to the teeth and frequently to the forehead, simulating frontal sinusitis.[14]

Frontal sinuses: Headache originating from the frontal sinuses starts on awakening or early morning and disappears in late morning. The pain and headache are localized to the forehead on the side affected, with presence of tenderness by palpation.

Anterior ethmoid sinuses: The pain is across the nose and above the eyes.

Posterior ethmoid and sphenoid sinusitis: The pain may be referred anywhere due to the proximity of the sphenopalatine ganglion. The pain is felt deep in the nasopharynx, vertex, and occiput.

Chronic sinusitis: Chronic inflammation rarely causes headache or pain. In fact, the presence of a headache speaks against such a diagnosis.

Eyes. Headache of eye origin is common but greatly exaggerated. Pain-sensitive structures in the eye are the following:

Conjuctival disease: localized pain only, no headache.

Corneal inflammation: very severe, localized pain and photophobia; occasional frontal headache relieved by local anesthetic and occlusion of the eye.

Iritis and cyclitis: the pain is localized to the eyeball with the headache in the temples of the affected side, relieved by atropine. The pain is caused by a spasm of the iris and ciliary muscle.

Glaucoma: Only the acute congestive type is extremely painful. The chronic type with a slow course may not show any symptoms except decreased visual acuity and

constriction of the visual fields. The pain of glaucoma is constant, extremely severe, and is accompanied by headache in the forehead and temples and usually in the occiput as well, secondary to muscle spasm of the occipital area. Nausea and vomiting are common. Vision is blurred. Mydriatics, caffeine, rapid ingestion of water, and mental upsets may precipitate an attack, especially in the narrow angle type.

Refractive errors: Only hyperopia and astigmatism cause headache not related to the degree of abnormality. Myopia causes headache only if it is over-corrected and thus rendered artificial hyperopia. The characteristics of this type of headache are: The onset is usually in the afternoon or after the use of the eyes for close work, movies, or traveling in or seeing moving objects. It is relieved by rest of the eyes or sleep. Thus, it is easily differentiated from histamine, hypertensive, and migraine headaches, all of which occur in the early morning and have no relation to the use of the eyes. The etiology of this headache is a sustained ciliary contraction in an effort to accommodate.

Muscular imbalance: only the phorias with good fusion and binocular vision cause headache as the extra-ocular muscles sustain a spasm in an effort to keep a normal axis. The headache may start after a short use of the eyes. When binocular vision is lost by loss of fusion as in squint, there is no headache. With the headache of phorias, there is often dizziness, nausea, and vomiting. Occipital pain is frequently due to spasm of the occipital muscles, especially in sustained abnormal tilting of the head or holding it in fixed positions.

Ears, mastoid, and their complications. The ears participate in referred pain from many areas and send referred pain to the same areas, due to the combined nerve supply from V, VII, IX, and X nerves and upper cervicals. Thus, inflammation of the larynx, pharynx, tonsils, nasopharynx, lower molars, and temporal mandibular joint may refer the pain to the ear on the same side. Inflammation of the ear refers the pain to these different areas, either directly through these nerves or indirectly by a secondary muscle spasm of the temporal, masseter, and occipital muscles. From these, new foci of pain radiate to further areas.

Deep seated constant headache following a mastoidectomy may indicate a brain abscess. The triad of Gradenigo's syndrome, with discharge from the ear, sixth nerve palsy, and trigeminal neuralgia indicate petrositis.

Cerebellopontine angle tumors cause vertigo, deafness, and headache. Labyrinthine tests with involvement of all the semicircular canals of the affected side and only the vertical canals of the opposite side point to this diagnosis.

Herpes zoster of the ear with possible facial paralysis and neuralgia with typical vesicles in the auricle and drum should be easy to diagnose.

Teeth. Pain and headache originated from teeth are familiar. The upper teeth refer the pain to the cheek and temple; the lower teeth, especially the molars, refer the pain to the ear and postauricular area. Occipital pain is common by secondary muscular spasm.

Temporomandibular joint. Headache and pain originating from involvement of this joint are commonly overlooked even by dentists. The pain is referred to the ear and the headache is present in the temple and occiput. There is commonly a spastic tenderness over the masseter and temporal muscles. The cause is usually malocclusion, ill-fitting dentures, or absence of molars on one side, thus causing pressure on the joint.[15] Obstructive deafness is commonly due to eustachian tube blockage. Correction of the malocclusion or building up of the molars will relieve the symptoms.

Myalgias and Occipital Pain. This is perhaps the commonest type of pain because it may be primary or it may be secondary to all the other types of pain already discussed through a reflex spastic contraction. In such a case, these muscles become a source of pain radiating to the occiput and neck. The temporal and frontal muscles participate to a lesser degree. This type of headache is a deep, steady ache, not throbbing in type, as compared with vascular headaches, which are intermittent and throbbing. There is tenderness in spots at the insertion of the muscle involved with painful and tender nodules and a sensation of stiffness. The cause is probably a reduced blood supply by a vascular reflex constriction with ischemia and pain.

The types are as follows:[1,m] (1) spasm referred from foci of pain in eyes, sinuses, teeth, ear, and temporomandibular joint; (2) anxiety—a tension headache with sustained contraction of the muscles which can be brought about voluntarily by holding the head in a fixed position; (3) exposure to colds and drafts; (4) myositis —rheumatic headache following respiratory infections, sore throats, and flu—present on awakening, aggravated by sudden jolting of the head, and accompanied by stiffness and tenderness of the muscles, with a course of from two to eight weeks; and (5) arthritis of the cervical spine with pressure on the spinal nerves, and a steady and radiating pain which is worse at night and continues in the daytime.

Treatment: All these occipital neuralgias respond to the same treatment. (1) The primary focus of pain in the reflex spastic type must be removed. (2) Heat from any source may be applied, followed by massage with or without an ointment, such as imadyl ointment, which contains histamine, followed again by further heat. (3) Sedatives of the barbiturates group may be used. (4) Novocaine, 1 per cent, injected in the tender spots may start relaxation of the muscles and be effective for days and even weeks.

Post-traumatic headache. Headache caused by subdural and epidural hematomas, subarachnoid hemorrhage, and basal adhesions has been discussed.

A recurrent type of headache following injuries is a common one and may be of two varieties: (1) pressure such as constant non-throbbing headache, due to muscle spasm; and (2) recurrent, periodic, throbbing headache due to external carotid dilatation, migraine-like. These two are usually co-existent.[1,n]

About 50 per cent of these cases that sustain head injury severe enough to need hospitalization develop

post-traumatic headaches. A good quiet rest after the accident diminishes the severity of the headache and early ambulation precipitates it. The headache develops much more frequently in the emotional and anxious patients, especially those who think the trauma was their fault or someone else's, and those who are looking for compensation as a result of the injury. Anxiety, however, and mental exhaustion after hard mental work may precipitate the attack in the late afternoon. Dizziness and vertigo, with sudden change of position of the head, are common symptoms by the excitation of the vestibular centers through overflowing of the painful stimuli over the affected nerves. Although the headache is post-traumatic, it does not have any pathological basis in the injured part of the head but is extracranial in origin, similar to migraine and occipital neuralgias.

Atypical facial neuralgias. These are variable head pains related in mechanism to migraine. The attack is precipitated by emotional strain or confiicts. They are caused by a vasodilatation of the external carotid artery, especially the internal maxillary branch.[1,o] This type of pain may be confused with neuralgias and must be differentiated, as alcohol injections are not needed and may be useless. This type of pain is steady, deep, aching, unilateral, localized to the lower half of head and face, involving cheek, eye, orbit, low forehead, temple, ear, and occipital area. It is usually accompanied by smooth muscle and vasomotor phenomena like swelling of mucous membranes, lacrimation, photophobia, and nasorrhea. Under this type of headache falls the Sluder or sphenopalatine ganglia syndrome, vidian nerve syndrome, and histamine cephalalgia.[1,o] Sluder [15] believes they are caused by a stimulation of the sphenopalatine ganglia and its branches. Wolff [1,o] believes they are due to internal maxillary dilatation as they are relieved by ergotamine. Correction of a septal deviation or hypertrophic turbinates may relieve the pain if it is due to a stimulation of the nerve ending in the nose. Cocainization of the affected area proves the etiology if it relieves the pain. Novocaine injection in the sphenopalatine ganglia may relieve the syndrome for a variable time.

Typical neuralgias. These are low head pains similar to atypical neuralgias in location. The pain is intermittent, shooting, severe, with deeply-localized component and a superficial burning component. The pain is limtied to the distribution of the nerves, precipitated by a stimulation of trigger zones such as during talking, eating, or mere touch.

Vasoconstriction of the vessels supplying the nerve ganglia is probably the primary cause as a large dose of a vasodilator early in the attack may improve the pain.[1,p] Alcohol injections to the nerve ganglia, or nerves proper, and intracranial resection remain to be the only available treatment. Trichlorethylene inhalations remove the pain originating in the fifth nerve for a short period and must be repeated frequently, making such treatment impractical. (See Table III.)

TABLE III

FACIAL NEURALGIAS

	Atypical	*Typical*
Age	Young	Old
Site	Not related to typical nerve distribution	Related to typical nerve distribution
Type	Steady, deep, diffused type	Short, intense, shooting, paroxysmal pain with burning of skin
Trigger zone	Absent	Present
Treatment	Vasoconstrictors, anesthesia of affected areas topical or into ganglia	Vasodilators—alcohol injection, resection of nerves
Pathogenesis	Dilatation of ext. carotid, stimulation of nerve endings	Vasoconstriction of nerve ganglia

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Analytical Hypertension: Clinical Observation of 2,163 Male Students

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William James, it is said, described some people as tough and others as tender. We have found that between ages 18 and 24 there are also many who are tensive. Numerous workers have tried the experimental method to show constitutional factors in patients manifesting tensive reactions. The literature contains many fine articles from which many practical inferences may be drawn. James Paget [1] coined the expression "clinical science" and said of it, that, "within our range of study, that alone is true which is proved clinically, and that which is clinically proved needs no further evidence."

Review of Clinical Reports

The literature abounds with studies in which mean blood pressure values have been established for subjects in the age group of college students.[2,3,4,5] Levy et al [6,7] have described "transient hypertension." Various investigators subscribe to the neurogenic origin of hypertension in effect, for they agree that the nervous system is the central point of disturbance before any structural changes have taken place. There is disagreement, however, as to the etiological influence on the nervous system: Weiss [8,9] and his co-workers account for the influence on a psychosomatic basis; Ehrstrom [10] and Ginsberg [11] on a psychogenic basis; Urschel [12] and Stieglitz [13] on an emotional basis; Barker [14] on a neurogenic vasomotor basis. Diehl[4] states that nervousness and excitement are the most frequent factors in producing temporary arterial hypertension in young people and that fatigue of blood vessel musculature perpetuates tension. Hines [15] described vascular hyperreaction mediated through nerve reflexes in clinical measurement of blood pressure reactions to a standard stimulus. Schroeder [16] et al on an experimental basis used drugs to measure nervous responses. Actuarial [17] as well as clinical [7] and experimental studies [15] are in agreement that vascillation in early hypertension statistically antedates sustained hypertension. These investigators have observed or measured exaggerated responses of the nervous system resulting from normal stimuli of various kinds. In practical significanc they are not very far in advance of Sir Clifford Allbutt [18] who recognized more than fifty years ago that arterial hypertension sometimes arises in the absence of renal disease.

As pertinent as these studies may be they are not accepted with finality by such writers as Bradley [19] who in reviewing the subject of neurogenic reflexes states that there is no quantitative footing to support the hyperreactor and emotional theories of hypertension. There is general disagreement among workers as to the similarity between experimental and human hypertension as produced by the Goldblatt method of constricting the blood supply to the kidney.[20] Pathologists who have studied the blood vessels of hypertensive patients are at variance as to the relationship the occasional vascular structural changes bear to the clinical progress of hypertension.

Review of Clinical Study

Current popular forms of treatment are experiencing declining usefulness for such investigators as Proger [21] and Goldring [20] accept the low salt regime only when myocardial failure accompanies hypertension. Proger further feels that restrictive therapy in the form of the Rice Diet is of value in treatment only when renal and myocardial failure accompanies hypertension. Surgical interruption of nervous pathways[22,23,24,25,26] over which abnormal tensive influences are judged to pass is being used with increasing caution as it becomes apparent that a social sympathectomy is more inclusive than a surgical sympathectomy. Pharmacological blocking [27] of the same pathways produces effects too transient to be more than a minor adjunctive form of therapy.

The literature reveals pertinent observations and suggestions as to the treatment of hypertensive subjects. Brush,[28] Campbell,[29] and Brooks and Carroll [30] in clinical studies of the effect of rest and sleep on blood pressure observed a significant fall during rest or sleep which was proportionate to the number and length of rest periods. Adson and Allen recommended lying down at midday in a dark, quiet room. Jacobsen [31] suggests relaxation on a progressive basis. Barker [14] states that the time to be successful in treatment is in the early stages.

With such introduction as this review of the literature serves, we wish to present our experiences gained in the examination of 2,163 male students, aged 18 to 24, examined between February 1, 1947, and June 1, 1948, and in which 382 or 17.6 per cent were found to have elevated blood pressure.

In the freshman year every student underwent a physical examination. Those students with a blood pressure greater than 130 millimeters mercury systolic and 85 millimeters diastolic reported to the University Health Center on three successive days for re-examination. On each occasion the same nurse recorded the blood pressure at the level of the heart, on the right arm with the student comfortably supine, then on the left arm while still supine, followed in two minutes on the left arm

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while standing. Beginning one week later every tensive student had blood pressure readings at one, two, three and four week intervals successively. Subsequent readings were taken at monthly intervals throughout the school year.

All determinations were on the arm, using the auscultatory method, and following the criteria established by the American and British Committees on the Standardization of Blood Pressure in 1930. In each determination the blood pressure cuff was inflated above the systolic pressure level and the pressure allowed to drop gradually through the diastolic level which was regarded as the pressure at the point where there was a distinct muffling of sounds. Whereas the first four readings in every case were taken by the nurse, all subsequent readings were taken by the physician. In checking the values with each other it was found that readings tallied with an accuracy of 4 mm. in over 95 per cent of cases.

On the initial physical examination 382 (17.6 per cent) of the 2,163 students had blood pressure readings greater than 130 systolic and 85 diastolic pressure. The 382 students with blood pressure readings greater than 130/85 have been restudied and it was found that: 132 (34.5 per cent) students had blood pressure readings subsequently come within normal limits more often than not; 231 (60.5 per cent) students whose values were more often elevated than not; 19 (4.9 per cent) students whose values were elevated as many times as they were below 130/85. Urinalysis performed at the time of each set of blood pressure readings revealed 33 students whose urine persistently contained albumin and sugar.

Since there are a small number of cases, 33 (8.6 per cent), having blood pressure readings greater than 130/85 and albumin and sugar in the urine relative to the number, 349 (91.3 per cent), without albuminuria and glycosuria, our working principle has been that an abnormally elevated blood pressure is due to nerve tension or nerve hypertension. The Health Service has further looked upon these cases as renogenic (kidney origin) or neurogenic (nervous origin) respectively, having clinically excluded the less common disease causes of hypertension (coarctation of aorta, adrenal tumors, pituitary syndromes, pyelonephritis, etc.). The renogenic group is differentiated from the neurogenic hypertensives solely by the urinary findings—albuminuria and glycosuria. A study of the urinary sediment in each case was essentially negative for findings of kidney disease. Moreover, each case had a normal concentration—dilution kidney function test, as well as a negative test for orthostatic albuminuria. In further excluding a disease basis for tensive cases, every student had an examination of the eye grounds reported as within normal limits.

Accepting these principles as true, treatment was instituted in all cases having elevated blood pressures, feeling that those with persistent albuminuria and glycosuria (renogenic) were just as worthy of treatment as those with nerve hypertension without urinary findings (neurogenic).

Treatment has consisted of one-hour daily rest periods in the University Health Center in a dark, quiet room during the middle of the day. Since the rest periods for students are regarded as the equivalent of physical education our practice has been to divide the day in two by a period of physical medicine. The object of treatment is to train tensive students in the art of nerve relaxation. It is hoped that they may be conditioned to the acquired habit of rest periods that will continue down through the years. Early in the course of treatment, three conferences with the examining physician are arranged for every tensive student, in which the philosophy of conscious relaxation is discussed. The calculated disciplinary control of blood pressure that is expected as a result of treatment is emphasized. At the conclusion of each school year a colloquium is arranged for all those under treatment. Included in this meeting is a report of the average blood pressure values at the beginning and end of treatment and a questionnaire period for individual problems.

Every student we are reporting was examined by an eye, ear, nose and throat physician, a dentist, an internist, a surgeon and a neurologist under the same conditions. We have established a generous standard of 130 millimeters (mercury) systolic and 85 millimeters diastolic pressure and selected our patient-students as abnormal, if their blood pressures were greater than this empirical standard. By our observations, the observations of the nurses and a blood pressure cuff we have found a pattern in 17.6 per cent of students which we call tensive. We emphasize that we did not make the elevated blood pressure, we measured it. We consider it a part of the whole organism rather than a measurement of a division of the nervous system.

By way of making an incomplete report on the personality traits in hypertension, our nursing staff has used the following adjectives in describing over one third of our tensive students: unduly anxious, impulsive, irritable, high-strung, over-assertive.

Discussion

While we do not say when hypertension begins we do say that to study hypertension, study adolescence. In support of this recommendation, Barker[14] has pointed out that the time to be successful in study and treatment of hypertension is in the early stages. Robinson and Brucer[5] point out that a person whose blood pressure fluctuates higher than 120/80 during a twenty-four hour day and continues to do so throughout the years will become within a ten-year period definitely hypertensive. An editorial of the *British Medical Journal*[32] of May 7, 1949, observes: "It is fundamental to the understanding of essential hypertension to realize that an increase in the blood pressure due to any cause, physiological or pathological may be followed by a further increase, this secondary hypertension often persisting after the primary cause has ceased to operate."

The principle of rest treatment has been well documented clinically and experimentally. Our means of resting in order to interrupt the daily routine appears to have been anticipated by others. Smirk[32] states that "the concept of numerous causes of hypertension should lead to investigation of the responsible causes in everyday life." The editor of the *British Medical Journal* of

May 7, 1949, states that "the tendency to exhibit the transient hypertension in response to mental and other stimuli may be taken to indicate a physiological makeup which is likely to express itself in daily life by abnormally strong and frequent blood pressure elevations." It is further held by the same author that the "raised blood pressure in essential hypertension precedes pathological changes in arterioles—it follows that renal ischemia due to vascular changes cannot be the initial factor in the production of essential hypertension. It is conceivable that in youth the disease is etiologically different from that arising after middle life."

Variability of blood pressure levels in our studies has been more characteristic and more constant than elevation and we feel that this supports our neurogenic pattern. We feel that our observations regarding variability include what is regarded by others as transient hypertension (and certainly our age groups match the age groups of the subjects of other investigators). It is equally interesting to note that there existed as much vascillation of blood pressure in the renogenic as in the neurogenic group.

Summary

We believe the favorable response to progressive relaxation that we have reported to our tensive students following sustained disciplinary control of the basic neurogenic factors is due to assuming the position of relaxation daily and losing the effort of posturing. While our study shows that one out of 12 students with hypertension is renogenic it also shows that 11 out of 12 are neurogenic; it is this latter group that percentage wise is most worthy of continued observation and we hope that our work will be provocative to further investigation.

* * * *

The authors are indebted to Frances F. S. Koran, R.N., and Helen M. Ford, R.N., for their assistance in coordinating the management of this study.

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What Can Be Done for the Deaf Patient

William K. Wright, M.D.
Fargo, North Dakota

Deafness is a very common condition. It is also one of the most disabling afflictions possible, for hearing and speech are the universal methods of communication. Without hearing the congenitally deaf child remains a deaf mute and the school-age child lapses into inattention and is wrongly considered stupid. Deafened adults may be deprived of desirable positions and in old age may be joked about. Non-hearing continually makes the deaf patient a subject of misunderstanding or forces on him a reputation for indifference toward his friends. Rehabilitation of these individuals, therefore, becomes a very needed and much neglected phase of medicine which has heretofore been left largely to the hearing-aid salesman. The management of deaf patients clearly belongs in the hands of the physician. In fact, diagnosis of the cause of deafness as well as much of the specific therapy can often be carried out by the general physician.

Types of Deafness—Diagnostic Methods

Normal hearing requires an intact functioning conduction mechanism consisting of a patent auditory canal, an intact ear drum, a normal middle ear, and a mobile ossicular chain. It also requires a normal inner ear consisting of a normal nerve and a normal cochlea containing a normal organ of corti. Deafness can thus be divided into *conduction deafness* due to a breakdown in part of the conduction mechanism and *nerve, or perception, deafness* due to a lesion in the inner ear or hearing nerve. Central hearing pathways partially cross and are thus seldom the cause of hearing defects. The differentiation of these two main types of deafness is of prime importance in therapy for although all forms of conduction deafness can be cured with the restoration of functional hearing, very little can be done medically for nerve deafness. The differential diagnosis of these two types depends upon two facts. Both types have diminished hearing by air conduction. However, hearing by bone conduction is diminished in nerve deafness and normal in conduction deafness. Bone conduction is the index of nerve function. This can very nicely be brought out by clinical audiometry which separately measures the loss in decibels for both air conduction and for bone conduction (Figs. 1 and 2). This quantitative determination is especially valuable when there is a mixture of the two types of deafness. From a practical standpoint, however, the following qualitative tests with tuning forks enable us to make the diagnosis of the type of deafness very nicely:

1. The *Rinne test* in which the patient's air and bone conduction are compared by alternately holding the prongs of the tuning fork 1 cm. from his ear and then placing the handle of the tuning fork against the patient's mastoid process. In conduction deafness the patient will hear by bone conduction much longer than by air conduction.

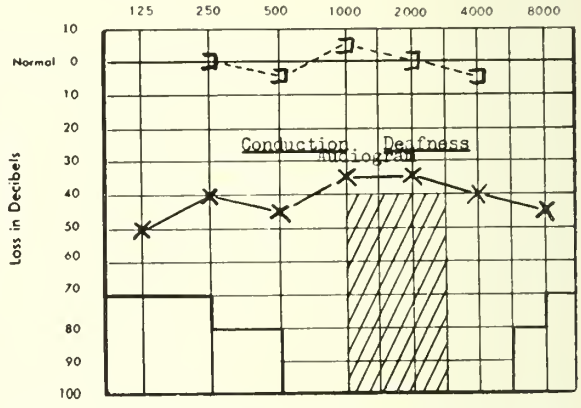


Fig. 1. Conduction Deafness. Audiogram—Hearing normal by bone and decreased by air. Rinne Test—Bone conduction better than air conduction. Schwabach Test—Bone conduction normal. Possible clinical characteristics: (1) uses quiet voice, (2) hears better in noisy place.

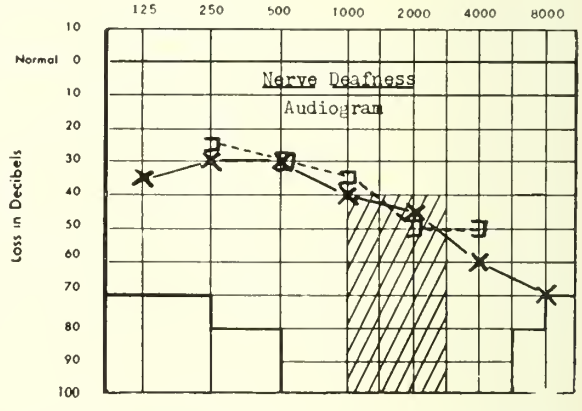


Fig. 2. Nerve Deafness. Audiogram—Hearing by bone and air decreased equally. Rinne Test—Air conduction better than bone conduction. Schwabach Test—Bone conduction below normal. Possible clinical characteristics: (1) uses loud voice without realizing it, (2) poor voice quality in long standing deafness, (3) hears very poorly in noisy place.

2. The *Schwabach test* in which the bone conduction of the patient is compared with the bone conduction of the normal hearing examiner by placing the handle of the fork alternately against the patient's mastoid process and then the examiner's mastoid process. Shortening of the patient's bone conduction as compared to the examiner's means nerve deafness.

3. The *Weber test.* This is the least important of the

tests, useful in unilateral deafness. The tuning fork handle is placed against the patient's forehead and he is asked in which ear it is heard. In nerve deafness the fork is lateralized to the good ear while in conduction deafness it is lateralized to the deafened ear.

For maximum accuracy, several frequencies of tuning forks are used in these tests, but for practical purposes the 256 fork will usually be adequate. Clinical distinction between these types of deafness is often possible from the history alone. The patient with conduction deafness having normal bone conduction hears his own voice well. Therefore, he speaks in a very quiet voice and hears well in noisy places. In nerve deafness the patient hears better in quiet places and, since he has poor bone conduction, he hears his own voice poorly and is inclined to talk loudly and even to shout without realizing it. In long standing cases there may be a gradual loss of voice quality from omitting sounds not heard well for years.

Classification of Deafness

conduction deafness

There are seven causes of conduction deafness. For all of these there is a medical treatment which can result in a restoration of functional hearing.

1. *Occlusion of the external auditory canal* by wax, foreign bodies, swelling, stenosis, or bony closure. Diagnosis is by inspection and therapy is obvious.

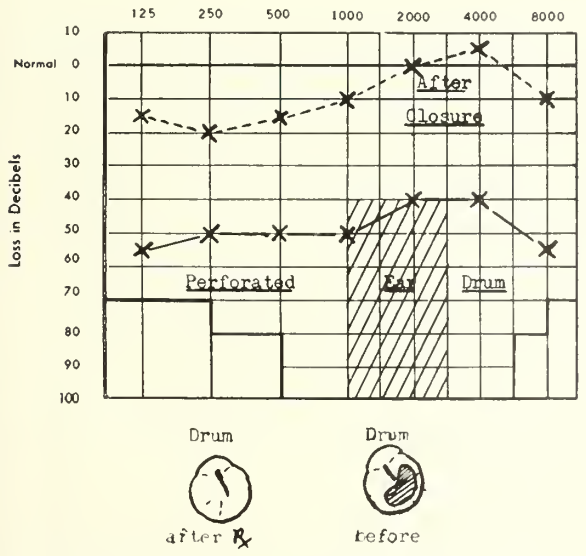


Fig. 3. Perforated Tympanic Membrane. Hearing improved following closure of perforation by 11 weekly treatments.
X——X = Before treatment. X------X = After treatment.

2. *Perforation of the tympanic membrane* (Fig. 3) from trauma or infection. Diagnosis is by inspection. Regardless of size or duration, these perforations can usually be closed. Treatment consists of destroying the epithelium on the edge of the perforation at weekly intervals with 50 per cent (saturated solution) trichloracetic acid after 2 per cent pontocaine anesthesia. The granulations thus produced slowly close the perforation. The acid is applied with a tiny cotton ball on the end of a thin wire applicator. It should be moist but not dripping with acid and the white eschar thus formed on the drum should be at least 1 mm. wide all the way around the edge of the perforation. If the ear is dry the drum must be kept moist with a small piece of cotton packed against the perforation and moistened with glycerite of hydrogen peroxide twice daily. Euthymol and antiseptic solution N.F. have also been used as moistening agents. If the ear is draining it must be dried up before closure is effected. In doing this, local cleansing and drops are necessary. It is also necessary to: Remove aural polyps, clear up chronic sinusitis, nasal allergy, enlarged adenoids, and occasionally to irradiate lymphoid tissue in the mouth of the eustachian tube with the radium applicator. If cholesteatoma is present, usually with a marginal or total perforation, closure should not be attempted and a radical or modified radical mastoid operation should be done. Closure is affected in four weeks to nine months, depending upon the size of the perforation. Where there is extensive scarring of the middle ear and ossicles, closure of a perforation may not restore the hearing. However, the patient is still benefited as he has a dry ear which does not drain after swimming or bathing and the hearing can later be restored if desired by a fenestration operation.

3. *Absence of tympanic membrane* from infection or following a radical mastoidectomy. Diagnosis is by inspection. Therapy is not necessary when the condition is unilateral. If a bilateral hearing loss is present, the hearing may be restored nicely in many cases by the Pohlman [1] artificial ear drum which the patient wears during the day with no less discomfort than eye glasses. A hollow ear mold is made for the patient and Cargile membrane is stretched across the bottom of the mold. A 20 gauge nylon rod is pushed through this membrane to touch and conduct sound near to the oval window. Hearing is good and adjustment for the patient is easy.

4. *Secretory otitis media* (Fig. 4) due to occlusion of the eustachian tube. This is the most frequent cause of hearing impairments in school children. It is characterized by a fluctuating or intermittent deafness often associated with earaches or colds. Small bubbles are seen behind the ear drum or a retracted amber colored drum may be present. The diagnosis is confirmed when the hearing is greatly or totally restored by inflation of the eustachian tube. Treatment consists of correction of the cause plus inflation of the eustachian tubes occasionally preceded by myringotomy. There are eight causes of secretory otitis media:

(a) The presence or recurrence of enlarged chronically infected adenoids. These are best removed surgically but occasionally the use of the radium applicator will result in a cure, particularly in adults.

(b) Hypertrophy of the lymphoid tissue around the mouth of the eustachian tube following adenoidectomy.

This is best treated by the radium applicator after the method of Crowe.[2]

(c) Acute and chronic sinusitis.

(d) Nasal allergy.

(e) Acute head colds.

(f) Mal-occlusion of the temporal mandibular joint. This condition often follows the removal of molar teeth which allows the powerful mastication muscles to cause an abnormal compression of the joint structures and the adjoining eustachian tube. The patient should be referred to a dentist for reconstruction of his bite.

(g) Carcinoma of the nasopharynx.

(h) Aero-otitis media caused by the failure of the eustachian tube to open during the rapid descent of an airplane. This may be predisposed to by a mild nasal infection or allergy.

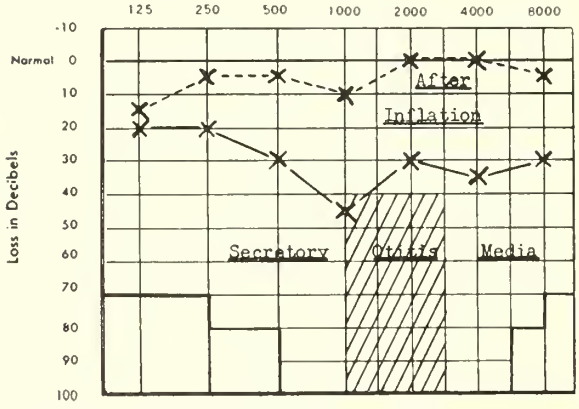


Fig. 4. Secretory Otitis Media. Showing immediate hearing improvement following inflation of the eustachian tube (Politzerization).

5. *Acute suppurative otitis media.* Diagnosis is by history and inspection of the ear drum. Therapy consists in the use of appropriate antibiotics. Myringotomy and occasionally a simple mastoidectomy may be necessary.

6. *Chronic adhesive deafness* is the result of scar tissue adhesions to the drum and ossicles following an acute necrotic suppurative otitis media. Diagnosis: History of a nonfluctuating deafness immediately following such a process. Examination shows a retracted scarred tympanic membrane with a conduction deafness not improved after inflation of the eustachian tube. Therapy as in No. 7 consists in the performing of a fenestration operation. Prognosis following this operation is as good as in otosclerosis, providing the tympanic membrane is intact.

7. *Otosclerosis,* (Fig. 5) the most common cause of deafness in early and middle adult life is due to a spongy bone overgrowth on the stapes interfering with its vibration. This disease affects about one out of one hundred adults in America and causes a slowly progressive deafness which is more common in women and has a slight hereditary tendency. Exacerbations are common following pregnancy. Both of these last two types of conduction deafness are amenable to the fenestration operation in which serviceable hearing can be restored in about 80 per cent of selected cases. Improvements made in the fenestration operation during the last few years have almost eliminated closure of the new window as a problem. Once hearing is restored there is a 95 per cent chance that the gain will be permanent.

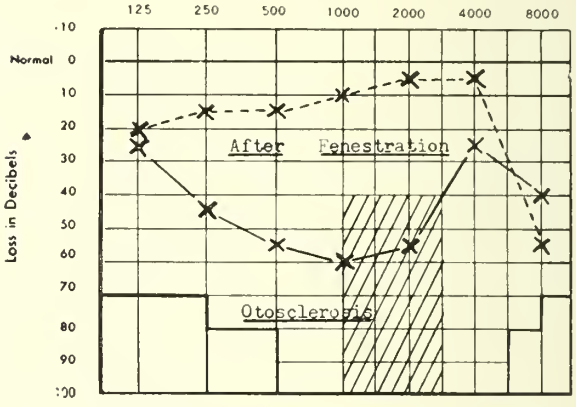


Fig. 5. Otosclerosis. Showing hearing gain following a fenestration operation.
X——X = Air conduction.]------] = Bone conduction.

NERVE OR PERCEPTION DEAFNESS

There are sixteen important causes of nerve deafness. The first seven of these have no known medical treatment or cure. They are:

1. *Congenital nerve deafness due to absence or malformation of the organ of Corti.* Familial tendencies and the acquisition of rubella or other virus infections in the first three months of pregnancy has been found to be etiological factors in some cases.

2. *Congenital nerve deafness* due to quinine poisoning from large doses of quinine taken by the mother during her pregnancy. It is possible to have a fetus totally deafened by a dose of quinine which will merely cause the mother's ears to ring temporarily.

3. *Cerebrospinal meningitis.* This may cause a complete and permanent destruction of hearing by invading the labyrinth through the cochlear aqueduct or internal auditory meatus.

4. *Basal skull fracture passing through the labyrinth or nerve.* This condition is usually irreversible. Tinnitus may persist for a long period following the fracture.

5. *Hemorrhage, embolus, or thrombosis of the cochlear division of the internal auditory artery.* This is an end artery and results in a sudden permanent loss of hearing accompanied by tinnitus and often vertigo.

6. *Senile nerve deafness* occurs universally over the age of 40. It is manifested by a gradual loss of hearing for the high tones; at about the age of 60 the conversational tones may be affected. Occasionally in certain families there is a predisposition for this condition to come on earlier.

7. *Labyrinthine otosclerosis.* This is a rare condition and differs from the usual type of otosclerosis in that the

labyrinth rather than the stapes is invaded by otosclerotic bone. Diagnosis during life is very difficult but the condition probably accounts for an occasional case of nerve deafness of unknown etiology.

While there is no medical treatment for these types of deafness, the physician has a very definite responsibility in the management of these people. If the deafness is bilateral, they should be directed to clinics or centers where:

(a) Properly fitted hearing aids can be selected to make use of residual functional hearing. Special speech tests are used to test the patient while he wears different makes of hearing aids. The same make of hearing aid does not fit all patients best, and the scores obtained frequently show real differences in performance.

(b) Lip reading can be taught so that the patient can fill in with his eyes the sounds which he misses even with his hearing aid.

(c) He can use table model hearing aids with extreme amplification to hear speech sounds which he usually misses. This helps to maintain voice quality.

(d) Congenitally deaf children can be taught speech and lip reading. Many of these children are then able to lead normal lives associated with normal hearing children. A few have even received university degrees.

In many mild cases, especially if the hearing loss curve is flat, this intensive program is not necessary. The patient will probably get serviceable hearing from any of several hearing aids and he will pick up adequate lip reading if the doctor will only advise him to watch the lips of those with whom he talks.

Medical treatment of the last nine causes of nerve deafness is often effective if diagnosis is established early and treatment is started without delay. These causes are:

8. *Congenital syphilis* which causes deafness as a part of Hutchinson's triad. The Wassermann test is not an accurate index of this condition. The loss usually occurs some years later than interstitial keratitis and is usually rapidly progressive, unless the condition is recognized and vigorously treated.

9. *Acquired syphilis* may cause a degeneration of the ganglion cells of the cochlea. Recognition and prompt treatment is necessary. In all cases with nerve deafness a Wassermann test should be done.

10. *Acoustic trauma.* These patients have a typical history that following exposure to continuous or sudden intense loud noises they suffered a temporary deafness accompanied by loud tinnitus. When the acoustic insult is not continued the tinnitus gradually disappears and the hearing is at least partially restored. The most greatly affected frequency and the last to recover is the 4,096 vibration frequency. Therapy consists in the recognition of the condition and the withdrawal of the subject from exposure to such acoustic trauma. If this is not done, permanent deafness ensues.

11. *Acoustic neuroma* causes a progressive unilateral deafness accompanied by a loss of vestibular function on the same side followed by involvement of the fifth, sixth, and seventh cranial nerves and by cerebellar ataxia. Every case of unilateral progressive nerve deafness should have caloric tests for vestibular function.

12. *Serous or suppurative labyrinthitis secondary to otitis media.* Both of these conditions should be treated intensively with antibiotics. If a serous labyrinthitis is present, a complete or partial recovery may occur over the first month or so, but after that the residual hearing loss is permanent.

13. *Toxic nerve deafness from acute infections* such as scarlet fever, rheumatic fever, influenza, measles, pneumonia, and mumps. (Mumps usually causes a unilateral deafness.) The hearing loss occurs during the acute toxic stage of the infection. Partial recovery may occur during the first month or so of convalescence after which the hearing defect remains stationary. Penicillin, antitoxin, and convalescent serum may be helpful adjuncts toward preventing or minimizing the deafness.

14. *Toxic nerve deafness from drugs.* These include particularly quinines, streptomycin, salicylates, and sulfonamides. Usually the loss is accompanied by a high pitched tinnitus. Individual idiosyncrasies and the total dose of the drug taken are the determining factors regarding the damage. Early recognition and withdrawal of the drug may be followed by improvement over the first month or so but then residual hearing loss is permanent.

15. *Toxic nerve deafness from focal infection* is probably a relatively infrequent condition. Nevertheless every patient who develops a progressive nerve deafness of unknown etiology should have obvious foci of infection (abscessed teeth, tonsils, and sinuses) cleared up to arrest possible progressive deterioration of the hearing.

16. *Meniere's disease* (labyrinthine hydrops). The pathology consists in the dilatation of the endo-lymphatic sytem. The etiology of this condition is not known, although some form of allergy is to be suspected. The condition is characterized by sudden attacks of vertigo and tinnitus with a fluctuating progressive nerve type deafness. Conservative therapy consists of allergy tests, a low salt diet, the use of nicotinic acid, histamine, potassium nitrate, phenobarbital, and hyoscine. Acute attacks may be aborted by adrenalin, histamine, or benadryl. Where medical management is unavailing the Cawthorne [3] or Day [4] operation and more recently the destruction of central vestibular nuclei with streptomycin are to be considered to relieve distressing attacks of vertigo.

In all of these last nine cases of nerve deafness the treatment consists in the removal of the cause and even if hearing is not regained progression of deafness may be arrested. If deafness persists and is bilateral, management should be carried out as outlined under noncurable nerve deafness. In addition the patient should be cautioned about possible causes of further hearing loss so that he may conserve residual hearing intact.

Many nonspecific medications have been suggested and tried in the therapy of nerve deafness such as thiamine chloride, vitamin B complex, multiple vitamins plus amino acid, nicotinic acid, and histamine. These medications may be tried as adjuncts even in long

standing nerve deafness and can certainly do no harm. However, their actual value in therapy is still open to question.

PSYCHOGENIC DEAFNESS

This type of deafness, more common than is generally realized, is an hysterical phenomenon precipitated by the usual causes of hysteria. It is frequently encountered as a psychogenic overlay or increase in deafness superimposed upon an already existing organic deafness of milder order. The commonly recognized characteristics of this form of deafness are:

1. Wide fluctuations in the hearing loss.

2. Greater loss for pure tones than for speech.

3. Equal loss for both air and bone conduction. Few hysterical deafness cases have enough insight to simulate a conduction deafness.

4. Frequent temporary or permanent recovery from suggestion therapy or any convincingly given therapy.

5. The Doerfler-Stewart [5] test in which the patient's hearing is tested by speech tests in a noise background. As the noise is gradually increased the psychogenic deafness patient will hear much more poorly than an equivalent organic deafness.

6. Narcosynthesis.[6] The patient's hearing is tested with the audiometer. He is then put under light pentothal anesthesia or hypnosis and the hearing retested. The organic deaf patient will make the same score while the hearing of the psychogenic deaf patient will come up to normal or in a psychogenic overlay to the level of organic deafness.

Treatment consists in psychotherapy to resolve the conflicts causing the deafness. Many cases may be cleared up by any therapy in which the patient has confidence. This fact may account for some of the spectacular cures of long standing nerve deafness by vitamins, histamine, and other medication. It even enters into the fenestration picture. Dr. George E. Shambaugh, Jr., has stated that an occasional case of fenestration for otosclerosis, about 1 in 500, will produce an improvement in the unoperated ear equal to that in the fenestrated ear. This can only be explained as a case of unilateral otosclerosis cured by fenestration with an opposite ear psychogenic deafness cured by suggestion. Future work done on cures for nerve deafness and even conduction deafness should rule out psychogenic deafness before therapy is started.

CONCLUSION

Deafness is a ubiquitous, disabling handicap for which much can be done. The patient's welfare demands that the physician take over the management of this condition. The responsibilities of the general physician consist of:

1. Early recognition and diagnosis of the cause of deafness.

2. Therapy within the limits of his equipment and skills.

3. Referral of the remaining problems to hearing clinics and centers.

The functions of these hearing clinics and centers are:

1. To again screen the patients to single out those cases amenable to medical treatment.

2. To administer specialized medical care where possible.

3. To care for the balance of these patients by selecting hearing aids, teaching lip reading and speech.

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HEART DISEASE CONFERENCE SLATED FOR JANUARY

A National Conference on Cardiovascular Diseases will be held in Washington, D.C., January 18-20, 1950, under the joint sponsorship of the American Heart Association and the National Heart Institute of the U. S. Public Health Service.

Well Baby Care

H. G. Skinner, M.D.*
Rapid City, South Dakota

The Well Baby Care plan is one of the easier ways in which a general practitioner can introduce preventive medicine into his practice. The idea is simple. Babies are checked at stated intervals, even if they appear to be in excellent health. This presentation will outline a method of conducting such a plan.

For convenience the Well Baby Care plan may be divided into several parts, including the spacing of visits, history, measurements, laboratory examinations, physician's examination and recommendations. The spacing of visits, measurements and laboratory examinations are outlined in Table I. Table II gives the history and physical examination form. We use the tables published by Professor J. D. Boyd of the University of Iowa for the normal weight, length, and head size.

Table I

A. *Frequency of Examinations*
Age 1-12 months—Each month starting at one month
Age 1-2 years—Four times a year
Age 2-5 years—Twice a year

B. *Frequency of Laboratory Examinations*
Hemoglobin—1st, 4th, 7th and 12th month
2nd, 3rd, 4th and 5th year
Pinworm—6th month, 1st, 2nd, 3rd, 4th and 5th year
Urine—1st month, 1st, 2nd, 3rd, 4th and 5th year

C. *Frequency of Measurements*
Head—Each visit
Weight—Each visit
Length—Each visit

Frequently a low hemoglobin is found in children. According to Dr. Louis K. Diamond [1] a hemoglobin of 11 gm. is normal for 3 months of age, and about 12 gm. is normal for 6 months and one year. A series that we are studying at present indicates that hemoglobins lower than this are frequent. Many children with low hemoglobin are nervous, irritable, naughty or shy. Liquid iron-liver preparations or injections of liver frequently correct the hemoglobin level and the behavior problems.

Pinworm tests are done by means of the cellophane technique. We occasionally find pinworms in a six-months-old child. By the preschool age 20 per cent of the children may be infected.

The feeding problems that are most frequently encountered are related to vitamins and the use of meats in the diet. Often the children are not taking orange juice because they are allergic or do not like it. Here we advise ascorbic acid, 50 mgm. tablets, one tablet crushed and given each day. Many mothers do not give codliver oil until the need is pointed out to them.

Children are often started on strained meat as early as the second month because we have the impression that such a practice results in a high hemoglobin level and better health. The meat sheet we use is reproduced in Table III. We warn against the use of strained meat too long. Some children should start chopped meat at 6 to 8 months—almost all before one year. Children do not need teeth to break up meat and other lumpy foods. It is our practice to start meats and fruits before cereals. We give the fruits with a purpose. Apple-sauce is mixed with the meat to overcome the excessive stickiness, and prunes are used to overcome any tendency to constipation.

Table III
Meat for Your Baby

Start your baby on strained meat.
Advantages: Meat is a good source of proteins, vitamins, and iron.
Disadvantages: It may constipate your baby. To overcome this tendency use prunes or apple sauce.
The difficulties for baby: Consistency of food is different. Has to learn to swallow without sucking.
Serving:
A. Mixing with formula. This is rather difficult. Two teaspoonfuls for bottle is plenty. Don't forget to enlarge the holes in the nipple.
B. Heat: 1. By emptying contents of can into double boiler.
2. By opening tin and placing in pan of water.
The disadvantage of heating is that the left-over portion is dried out.
C. Cold. Some children seem to enjoy the meat as well if it is not heated.
D. It is often essential to mix the strained meat with apple sauce so that the child will not find the mixture too sticky.
Storage: Unused portions may be left in the can. The can should be covered and left in the refrigerator.
We suggest that you give:
1. Beef heart lamb pork veal liver
2. Serve it (a) in formula, (b) heat, (c) cold, (d) cold or warm mixed with apple sauce.
3. Start with ..... teaspoonful and increase by ..... teaspoonful per day.
4. If meat constipates your baby use prunes and/or apple sauce.
5. Feed him the meat ..... times a day at .....

Psychological problems discussed include those relating to toilet training, forcing the child to eat foods the mother believes are good for him, and numerous cases of "nervous" mothers. Spock [2] and the books entitled *Infant Care*,[3] and *Your Child from One to Six*,[4] contain references for the mothers.

The most convenient means of handling this type of work is to have the history, laboratory work, and measurements done before the doctor sees the patient. Then the doctor reads the recorded material, does a physical and makes recommendations. We have found that when

*Director, Pennington County Health Department, Rapid City, South Dakota.

TABLE II

Infant and Preschool Medical Conference Record

Name ..... Sex ..... Race ..... Date of Birth .....

Parent's Name ..... Tel. No. ..... Referred by .....

Address ..... Physician .....

HISTORY

Birth and Neonatal

Period of gestation ..... Delivery: Spontaneous ..... Operative .....

Birth weight ..... Birth Registered ..... Condition of Child at Birth .....

Neonatal Period .....

Nutrition (T—table; S—strained; C—chopped)

Date										
Codliver Oil										
Vitamin C										
Milk										
Water										
Sugar										
Meat										
Cereal										
Fruit										
Vegetable										

Immunizations and Date

Smallpox .....

Diphtheria .....

Diph.-Tet. .....

Wh. Cough .....

Typhoid .....

Others .....

Operations .....

LABORATORY

Hemoglobin										
Pinworm										

Development

Sat up ..... Walked .....

First tooth ..... Formed sentences .....

Head steady ..... Dressed self .....

Crawled .....

Notes on Table II—

On the back of the sheet is an area entitled "Observations, Personal Hygiene and Physical Examinations." Down the left side are these headings: Date, age, height, weight, temperature, sleep, skin, scalp, head measurement, eyes, nose and throat, mouth and teeth, ears, lymph nodes, chest, abdomen, genitalia, spine, and extremities. There is room to record these findings for ten visits. Below that is a blank space for recommendations.

a clinic is run as a community service it is best that the recommendations which the doctor makes be explained to the mother by the nurse after the child has been seen by the doctor.

In private practice the doctor usually finds it advantageous to explain recommendations himself. Some doctors have booked all well baby examinations for the same office period, finding that concentration and routinization of this work lends to speed and increased efficiency.

The question of the fee for this care is important. It has been found by many that the office fee plus laboratory charges is not excessive. Others give one year's care for a flat fee. One thing must be made clear—the parent is paying for the examination and ordinary advice on feeding problems. Extra fees are charged if the child is ill or if unusual feeding problems arise. Too many doctors do not charge for examinations or advice on well babies, with the result that the doctor's professional time is not paid for, and the examination is often not well done.

If the principle of well baby care is accepted it can be used readily and will do much to further the practice of preventive medicine. A Well Baby Plan incorporated into a general practice can serve a most useful purpose and afford much real satisfaction.

References

1. Diamond, Louis K.: Textbook of Pediatrics :860, Mitchell-Nelson, 1945.

2. Spock, Benjamin: Common Sense Book of Baby and Child Care, April 1946. This book is also published under the name of The Pocket Book of Baby Care.

3. Infant Care, U. S. Children's Bureau, Publication No. 8, 1945.

4. Your Child from One to Six, U. S. Children's Bureau Publication No. 30, Revised 1945.

Note: There are six standard forms for the graphic representation of growth as compiled by Professor J. D. Boyd. They are: Boys 0-12 months, Girls 0-12 months, Boys 0-6 years, Girls 0-6 years, Boys 5-18 years, Girls 5-18 years.

These forms, which come in pads of 100 and cost $1.00 each, are available at Department of Publications, East Hall, State University of Iowa, Iowa City, Iowa.

American College Health Association News

The following is a list of new directors of student health services which have been coming in during the past few months.

Dr. Seth E. Smoot, Brigham Young University, Provo, Utah.

Dr. E. L. Persons, Duke University, Durham, North Carolina.

Dr. B. W. Lafene, Kansas State College of Agriculture and Applied Science, Manhattan, Kansas.

Dr. Harold W. Potter, New Jersey College for Women, New Brunswick, New Jersey.

Dr. Herbert R. Glenn, Pennsylvania State College, State College, Pennsylvania.

Dr. Quin Constantz, State Teachers College, Mankato, Minnesota.

Dr. George X. Trimble, Washington, St. Louis, Missouri.

Dr. J. K. Whittal, University of British Columbia, Vancouver, Canada.

Dr. Ralph Alley, University of Idaho, Moscow, Idaho.

Dr. George H. Agate, Illinois State Normal University, Normal, Illinois.

Dr. Joel J. White, University of New Hampshire, Durham, New Hampshire.

Miss Elizabeth Marshon, Cornell College, Mt. Vernon, Iowa.

Dr. Albert G. Lewis, University of Alabama, University, Alabama.

Dr. Joseph Gamet, Director, Student Health Service of Iowa State Teachers College, writes in to say that Dr. Thaddeus A. Staskiewicz of Chicago, Illinois, has joined the staff as Assistant Director. Dr. Staskiewicz is a graduate of Loyola University and University of Chicago School of Medicine, 1944.

The program for the annual conference in December is taking shape. Time will be given in the program for participation by members in attendance at the meeting. The topics selected will be of interest to all health personnel on a college campus. It is hoped that you will encourage the attendance of all health personnel at the meeting. Make your reservations at the Henry Hudson Hotel, New York City, immediately in order to be assured of a room. There are so many conventions being held at that time that rooms are at a premium. We want you to come to the meeting.

The JOURNAL LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology

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Editorial

REVISED PRINCIPLES OF ETHICS

When the principles of medical ethics of the American Medical Association were adopted by the house of delegates at Atlantic City, on June 4, 1912, it was concluded that while those principles express in a general way the duty of the physician to his patients and colleagues, it is not to be supposed that they cover the whole field of medical ethics, or that the physician is not under many obligations besides those herein set forth. In a word, it is incumbent on the doctor that his bearing toward patients, the public and fellow practitioner should be characterized by a gentlemanly deportment under all conditions, and he should behave towards others as he desires them to deal with him. Finally, these principles are primarily for the good of the public, and their enforcement should be conducted in such a manner as shall deserve and receive the endorsement of the community.

At the annual session held in the same city and in the same month, but thirty-seven years later, the judicial council submitted a restatement and revision of the principles of medical ethics and it was promptly adopted by the house of delegates. The most outstanding changes relate to group, clinics, contract practice, and purveyal of medical service. Ethics "are not laws to govern but principles to guide . . . An upright man instructed in the art of healing" seldom needs to refer to the code. Because it is one of the aims of the national association, however, to guard the high moral standards of the profession, the frequent perusal of these principles of ethics is not only recommended but should be a must on each physician's graduating anniversary.

A. E. H.

DATA ON TWINS REQUESTED

The study of twins is of great value in providing information concerning the respective importance of hereditary predisposition and environmental influences in disease in man. The results of the use of this method have shown a hereditary predisposition to tuberculosis, diabetes, and tumor formation, and a high, medium or low intelligence quotient.

There is some *a priori* evidence showing an hereditary predisposition for peptic ulcer. Only six cases of the occurrence of peptic ulcer in the one or both of mono- or dizygous twins have been reported in the readily accessible literature. Since twins are born in 1 of 86 births and identical twins in 1 of 344 births and the general incidence of ulcer is from 5 to 10 per cent there should be plenty of material available.

I should like to ask physicians to cooperate in assembling such material by sending me cases in which (1) one or both twins develop peptic ulcer, (2) the site of the ulcer, (3) the age of onset of ulcer, (4) the type of twins (monovular or diovular), (5) the sex of the twins, (6) the date of birth of the twins, and (7) the number and age of the brothers and sisters and the absence or presence of ulcer in each.

A. C. Ivy, M.D.,
Department of Clinical Science,
University of Illinois,
1853 West Polk Street,
Chicago 12, Illinois

THE UNIVERSITY MEDICAL SCHOOL SEMINARS

The first of a series of state-wide seminars on heart disease, cancer, and psychosomatic medicine for professional groups has been successfully inaugurated at Bemidji. On September 27 the first of eight consecutive weekly classes was held for the physicians of the Bemidji area at the Bemidji Lutheran Hospital. The faculty of the University of Minnesota School of Medicine, augmented by eminent practicing specialists, have provided lecturers for the physicians' meetings. Sponsored by the Minnesota State Medical Association, the University of Minnesota School of Medicine, and the Minnesota Department of Health, the Bemidji Seminar has been received with great enthusiasm by the physicians of the locality and it is believed that this will be duplicated at other seminars throughout the state.

Nurses of the Bemidji area have been utilizing the occasion of the physicians' seminar to hold eight meetings of their own the same evening and hour. The nurses' sessions are sponsored by the 11th District Nurses' Association, the University of Minnesota School of Nursing, and the Minnesota Department of Health.

Minnesota's second seminar, which will be held at Fergus Falls, is scheduled to start October 26. During the 1949-50 season these professional seminars, designed to disseminate postgraduate education throughout the state, are planned for nine Minnesota areas. As presently organized, the 1949-50 schedule marks the beginning of a continuous five-year educational program for professional groups.

Buy Christmas Seals



Help Stamp Out TB

News Briefs

North Dakota

THE SEPTEMBER MEETING of the Grand Forks District Medical Society was held in Grafton, North Dakota, on September 21. The guest speaker was Dr. Graham Kernwein of Minot, N. D., who discussed some of the problems involved in treating fractures of the ankle and wrist. About thirty doctors attended the meeting.

AT THEIR SEPTEMBER MEETING, the Stutsman District Medical Society voted to join the list of District Medical Societies who are participating in the North Dakota Physicians Service Plan, for the prepayment of surgical, obstetrical and fracture care.

THE NORTH DAKOTA PEDIATRIC SOCIETY held their fall meeting on October 15 at the Gardner Hotel, in Fargo.

DR. R. H. RAY, physician in Garrison since 1905, and Mrs. Ray were honored at an open house preceding their departure for California where they will make their home. Sponsored by the Garrison Civic Club, the open house was attended by more than 200 persons.

First president of the Garrison Civic Club which was organized about 22 years ago, the veteran McLean county physician is a native of the Dakota territory. He was born near Belmont in Traill county April 22, 1875. A graduate of the University of North Dakota in 1897, he received his M.D. degree from the Medico Chirugici, a medical school in Philadelphia which now is a part of the University of Pennsylvania. He practiced medicine in Walnut Grove, Minn., for four years before coming to Garrison.

TH'RTY-ONE WIVES of medical men of Cass county attended the first fall dinner of the Cass County Medical Association's Auxiliary Monday evening in the Gardner Hotel at Fargo. Mrs. B. C. Corbus of Fargo, president of the group, presided. Mrs. Orren Short of Fargo, state advisor on women's activities for the National Foundation for Infantile Paralysis, was the speaker.

DR. JULIUS TOSKY of Winnipeg, Manitoba, has located in Larimore, N. D., replacing Dr. Lloyd Ralston, who has moved to Grand Forks, N. D., where he will be associated with Dr. W. E. Liebeler.

Dr. JAMES D. CARDY, Fellow in Pathology in the Medical School of the University of Minnesota from 1946 to 1949, early this summer moved to Grand Forks, N. D., where he took over his post as professor and chairman of the Department of Pathology at the Medical School at the University of North Dakota.

DR. FRANK M. MELTON has recently joined the staff of the Dakota Clinic as head of the Department of Dermatology. Dr. Melton is a native of Kentucky and served his internship in the Louisville City Hospital. He received his postgraduate training in dermatology in the University of Pennsylvania Hospital, Philadelphia, and last year was an associate in dermatology at Duke University Hospital in Durham, N. C. He is a World War II veteran. He is certified by the Board of Dermatology and Syphilology.

DR. JOSEPH P. MCEVOY, St. Paul, Minnesota, has joined the staff of the Quain and Ramstad clinic at Bismarck.

Dr. McEvoy, who is an eye specialist, is a graduate of Minnesota Medical School and completed his internship at Ancker Hospital, St. Paul. Before coming to Bismarck he was associated with the Philadelphia General Hospital, Philadelphia, Pa.

THE KOTANA MEDICAL SOCIETY, in cooperation with the District Health office and the Williston hospitals, conducted the annual Diabetes Week October 10-16.

The purpose of Diabetes Week, a national function, is to detect undiscovered cases of diabetes before they become dangerous. For this purpose, free detection centers were set up in Williston during the week, to inform victims and refer them to physicians for treatment.

Dr. Alan K. Johnson, president of the Kotana Medical Society, was chosen chairman of the local diabetes detection committee, assisted by Dr. I. S. AbPlanalp and Dr. J. D. Craven. The members of the Kotana society who aided in the detection work, in addition to the members of the committee, were Drs. W. A. Wright, J. J. Korwin and E. J. Hagan of Williston and Drs. P. O. C. Johnson and Carlson of Watford City.

DR. DEAN F. NELSON, associated with the Fargo Clinic since June, 1948, has resigned to become a partner with Dr. Clyde Geiger and Dr. John R. Durburg in Chicago under whom he previously received training.

Dr. Nelson will be in charge of the training program for obstetrics and gynecology at St. Joseph's Hospital which is associated with Northwestern University, and also will be in charge of the obstetrical and gynecological outpatient department.

THE COMMERCIAL CLUB of Zeeland appointed a committee of local businessmen to study ways and means toward the establishment of a local doctor in Zeeland, with facilities to handle minor cases and emergency cases, in the form of a local clinic and first aid station.

DR. CHARLES B. PORTER has joined the staff of the Grand Forks clinic with his practice confined to diseases of the ear, nose and throat. The staff total 15. Dr. Porter received his advanced and medical education at Johns Hopkins University and Medical School in Baltimore and served his internship there. He joined the Mayo Clinic staff as a fellow in surgery in 1940, serving there until this fall, except for four years in the army medical corps during the war.

South Dakota

Dr. Lyle Hare, Spearfish doctor, has for the second time in as many years been named South Dakota's general practitioner of the year. The honor was voted by the council of the South Dakota State Medical Association at its fall council meeting in Huron.

Two hundred fifty people gathered at the Legion Auditorium in Presho on Monday evening, September 26, to pay tribute to Dr. and Mrs. F. M. Newman, who have been residents of Presho and Lyman county since 1905. This event marked forty-four years that Dr. Newman has given medical and civil service to this community.

Plans are under way for the organization of the Scotland Hospital and Home Association with a temporary board of directors including Dr. J. C. VanFerney as chairman. If the present plans are carried out, the South Dakota Hospital Management Association, headed by Dr. Arthur S. Schade, will give the necessary assistance in securing capable personnel for the clinic operation.

Dr. H. P. Rosenberger, eye, ear, nose and throat specialist with the Quain and Ramstad clinic in Bismarck for the past fifteen years, plans to go into practice with his brother-in-law, Dr. Fred Bunker, in Aberdeen.

Prior to coming to Bismarck, Dr. Rosenberger was with the Miller clinic in St. Paul and was an instructor in the postgraduate school at the University of Minnesota.

Dr. James H. Chalmers recently accepted a position as internist at the newly constructed Veterans' Hospital in Sioux Falls.

Dr. Chalmers was graduated from the University of Minnesota Medical School in 1941, including an internship at the Swedish Hospital in Minneapolis. From 1941 to 1942 Dr. Chalmers interned at Medical Center, Jersey City, New Jersey. For the past three and a half years Dr. Chalmers has had a rotating fellowship in Internal Medicine through the University of Minnesota, including General Hospital, St. Barnabas Hospital, Veterans' Hospital at Fort Snelling, University Hospital and the Research Laboratory at the University of Minnesota.

Minnesota

Dr. E. A. Boyden, Professor and Head, Department of Anatomy, University of Minnesota School of Medicine, has announced promotions of several staff members in that department. Dr. Lemen J. Wells has been promoted to Professor in the Department of Anatomy. Promotions to Associate Professor have been given to Drs. W. Lane Williams and Berry Campbell. Dr. Ronald M. Ferry has recently joined the faculty as Instructor in the Department of Anatomy.

Television became another medium for public health education recently for the Minnesota Heart Association. In a program via TV station KSTP, Minneapolis-St. Paul, Dr. Paul F. Dwan, former president of the Minnesota affiliate, appeared in a telecast devoted to rheumatic fever.

New Members of the Minnesota Medical Foundation are: Dr. Harold A. Williamson, Heron Lake, Minnesota; Dr. Howard A. Shaw, Minneapolis; Dr. E. S. Lippman, Minneapolis; Dr. B. A. Weis, St. Paul; Dr. T. J. Catlin, Buffalo, Minnesota; Dr. C. A. Fosmark, Madison, Wisconsin; and Dr. E. E. Greene, Westhope, North Dakota.

Establishment of the James Hoffman Bentson fund to provide a memorial for the late Dr. James H. Bentson at Mount Sinai Hospital was announced in Minneapolis. Dr. Bentson, 31, a fellow at Mayo Clinic, Rochester, Minn., died June 28 in New York.

Two Minnesotans were honored at the Minnesota public health conference September 30 for their long fight against tuberculosis. The conference is the Public Health Workers' Association annual meeting at the Nicollet Hotel. It conferred honorary memberships on: Dr. Walter J. Marcley, tuberculosis consultant for the state health department, who in 1897 opened the doors for the first state tuberculosis sanatorium in the United States, at Rutland, Mass.; and Dr. Ernest S. Mariette, who retired last month because of ill health, after 33 years' service as superintendent and medical director of Glen Lake sanatorium.

Dr. Robert F. McGandy was installed as president of the Hennepin County Medical Society at the annual meeting recently. He replaced Dr. Edward D. Anderson, who became chairman of the board of directors. Thomas P. Cook, executive secretary, announced a 15-year lease has been signed for the society's headquarters on the 20th floor of the Medical Arts Building.

New Locations

Dr. J. J. Ahlfs and Dr. H. W. Hermann of Caledonia announced this week that they have formed a partnership and will conduct their professional services under the firm name of the Caledonia Clinic.

Dr. Martin Munson will set up practice in Barnum. A graduate of the University of Minnesota in 1946, Dr. Munson served his internship in St. Luke's Hospital in Duluth. He served two years in the Army.

Dr. L. H. Flancher of Des Moines, Iowa, director of Sand Beach Sanatorium at Lake Park from 1925 to 1941, will return to the same post in the near future. Dr. Flancher will succeed Dr. R. R. Hendrickson, who resigned recently to become superintendent of Sunnyrest Sanatorium at Crookston. Since leaving in 1941, Dr. Flancher has been head of the tuberculosis department of the state department of health in Iowa.

North Dakota Communities Desiring Services of a General Practitioner

ANAMOOSE, McHenry County. Estimated population 600. Estimated drawing territory: 25 miles to south, west and north, 10 miles to east. Distance to nearest hospital: 16 miles to Harvey. Two-room office space available with adjoining waiting room, completed 1947. These spaces adjoin those of the dentist. Living quarters, a four-room apartment to the rear of the office space on the same floor level, available. There are no doctors between Anamoose and Minot and only one within the county. Nearest competition to the south is the doctor at McClusky; to the northwest, Towner, and to the northeast, Rugby. Hospital at Harvey is open to any doctor who wishes access to the hospital. Dentist set up practice in September 1948. Further information may be obtained by contacting Dr. L. C. Misslin, D.D.S., Anamoose, North Dakota.

GACKLE, Logan County. Estimated population 850. Estimated drawing territory: 25 mile radius. Distance to nearest hospital 40 miles. Community building modern health center, to be completed about December 1, 1948. 4900 sq. ft. building, brick and tile construction. Includes doctor's office, lobby, dentist office, laboratory, consultation room with dressing rooms; doctor's lab and x-ray; four double bed rooms with baths, delivery-operating room; utility rooms, kitchen and storage rooms, etc. Radiant heat in the floor. Board of trustees plan to permit the doctor to have more or less free rein in this project. Center being built by private individuals, without government assistance. Further information may be obtained by contacting C. C. Lehr, First State Bank, Gackle, North Dakota.

GLEN ULLIN, Morton County. Estimated population 1300. Estimated drawing territory: 30 miles all directions. Distance to nearest hospital 30 miles to Elgin. Office space (very nice) available. Housing can be arranged. Heart Butte dam is under construction by the Bureau of Reclamation 18 miles south of Glen Ullin. Town growing rapidly and can use a progressive doctor. Presently wonderful hunting facilities and with the completion of the dam, the best fishing possible. Further information may be obtained by contacting Jack Curtis, Publisher, The Times, Glen Ullin, North Dakota.

GOODRICH, Sheridan County. Estimated population: 600. Estimated drawing territory: 90 miles south, 30 miles north, 60 miles east, 20 miles west. Distance to nearest hospital 30 miles. Office space will be made available by Goodrich Commercial Club. Living quarters will be made available. (24 business places in town, 6 churches, good school, good bank). Need for doctor is great. Further information may be obtained by contacting W. A. Muralt, Goodrich, North Dakota.

McHENRY, Foster County. Estimated population 300. Serves rural area of 17 miles radius which includes three towns of 150 population each. Distance to nearest hospital, 34 miles. Nearest doctor, 31 miles. Home, conveniently located so it would serve equally well as an office, is available. Community nurse with considerable experience would be willing to assist doctor if desired. Town served by state and county highways that are maintained all year. Also served by McHenry Flying Service with all-weather flying. Community composed of prosperous farmers of mixed ancestry. Two churches, and several new buildings in business section. Further information may be obtained by contacting S. J. Hoffman, President, McHenry Commercial Club.

PEMBINA, Pembina County. Estimated population 750. Rural area with drawing territory 3 miles north to Canadian border and a 15-mile radius in other directions. Distance to nearest hospitals, 22 miles to Hallock, Minn., and 28 miles to Drayton, N. D. Modern community. Office and dwelling accommodations could be arranged. For further information contact F. F. Moris, City Auditor, Pembina, N. D.

RUTLAND, Sargent County. Estimated population 300. Estimated drawing territory a 25-mile radius. Distance to nearest hospital 32 miles. Community has a large house with surrounding lots, ideal for a hospital of six to eight beds or more, with office downstairs, or ideal for office and doctor's home. If doctor should not wish to purchase it himself, the town is prepared to form an association to remodel, purchase and assist in equipping same for the doctor. Many new commercial buildings being built in town. Has supported a doctor in the past. Nurses available. Further information may be obtained by contacting Mrs. Otto Meyers, Rutland, N. D.

STRASBURG, Emmons County. Estimated population 850. Estimated drawing territory: 25 miles west, 6 miles north, 25 miles east and 30 miles south. Towns south of Strasburg have no doctor. Distance to nearest hospital 78 miles northwest to Bismarck with very good hard-surfaced all-weather road. Office space available. Living quarters can be arranged. Located in rich grain belt and cattle community with the last nine years very prosperous. Community made up mostly of German-Russians with a Holland settlement south of town. Further information may be obtained by contacting J. M. Klein, Secretary, Strasburg Civic Club, Strasburg, N. D.

VELVA, McHenry County. Estimated population 1400. Estimated drawing territory, 25-mile radius. Distance to nearest hospital 22 miles. Office space and living quarters available. Previous doctor left to continue education in specialized work. Further information may be obtained by writing L. E. Kittilsby, Velva, N. D.

WILTON, McLean County. Estimated population 850. Serves rural area of 12-mile radius. Distance to

nearest hospital, 25 miles, hard-surfaced highway. Office space and living quarters available. Good territory, well-paying people. Some coal-mining nearby. Further information may be obtained by writing the City of Wilton, Wilton, N. D.

ASHLEY, county seat of McIntosh County. Estimated population 2000. Drawing territory radius of 35 miles. Distance to nearest hospital: Eureka, S. D., 32 miles. Cases usually hospitalized in Bismarck, N. D., or Aberdeen, S. D. Doctor who had been there deceased March 1949. Doctor's office and equipment, including drugs, available. Apartment available. One elderly doctor located in Ashley. Nearest doctors: Wishek, 25 miles; Kulm, 56 miles; Ellendale, 45 miles. Main industry in territory is farming. Very good business center. Business men in town working toward building a small hospital or clinic. Same was hindered in past due to lack of water and sewage facilities. These are now available, and there is the possibility that after a doctor locates there the business men will go through with it. County roads well maintained, snow removal equipment available. Further information may be obtained by writing Mrs. E. H. Maercklein, Ashley, N. D.

BUFFALO, Cass County. Estimated population 300. Estimated drawing territory: 20-mile radius. Distance to nearest hospitals: 40 miles to Fargo; 20 miles to Valley City. Hard surface roads open the year round. Good farming community. Office space available. Drug store located in community. Living quarters could be made available. Further information may be obtained by writing Mr. Lewis Easton, Chairman, Board of Village Trustees, Buffalo, N. D.

GRENORA, Williams County. Estimated population 600. Estimated drawing territory, radius of 20 miles. Nearest hospital, Williston, N. D. Community has a good school system, modern, with water and sewer, 40 business places, and will be the scene of the large pumping plant for the Missouri Diversion project. Drug store with registered pharmacist; good theatre, golf course, dual tennis court, nearby lake. Community contemplating building a hospital, but are waiting for a doctor to locate and give it his supervision. Further information may be obtained by writing Vern Steele, President, Grenora Commercial Club, Grenora, N. D.

LIDGERWOOD, Richland County. Estimated popualtion 1500. Estimated drawing territory, radius of 30 miles. Modern office building available. Living quarters will be available. Hospital facilities available at Wahpeton, N. D., and Breckenridge, Minn., both on hard surface highways. A good business community located in farming territory. Further information may be obtained by writing E. R. Dawson, Secretary, Lidgerwood Junior Chamber of Commerce, Lidgerwood, N. D.

RAY, Williams County. Estimated population 650. Drawing territory, radius of 25 miles. Distance to nearest hospital and doctor 35 miles. Completely remodeled building available for drug store, doctors offices, dental office, with two apartments upstairs. Farming and ranching community. Further information may be obtained by writing P. M. Schmitz, Secretary, Ray Health Center, Ray, N. D.

RICHARDTON, Stark County. Estimated population 1000. Estimated drawing territory unlimited North and South. Located on U. S. Highway 10, about 30 miles from Dickinson. A 20-bed hospital to be completed fall of 1949, equipped for major surgery. Office space and living quarters available. Good schools, churches, water, sewage, natural gas, dentist, drug store. Further information may be obtained by writing J. C. Klein, Pharmacist, Richardton, N. D.

Opportunities Open

HIPPOCRATES ESSAY CONTEST

A $100 government savings bond will be awarded for the best essay on "The Meaning of Hippocrates in the Medical World Today" by the United States Chapter of the International College of Surgeons. Entries, which will not be restricted to any certain number of words, must be postmarked no later than March 1, 1950. Although primarily of interest to medical students, the contest is open to anyone who wishes to enter.

The contest is being held in connection with the celebration of Hippocrates Day by the International College of Surgeons in Chicago October 23, 1949. Send entries to Essay Contest, care of International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Ill.

$1,000 IODINE RESEARCH AWARD

Any member of the American Pharmaceutical Association may propose a nominee for the 1950 Iodine Educational Bureau, Inc., Research Award. An award of $1,000 and an allowance up to $250 for travel expense will be given to the person who, in the opinion of the award committee of Iodine Educational Bureau, Inc., has done the most outstanding research in the chemistry and pharmacy of iodine and its compounds as applied in pharmacy or medicine. Nominations for the 1950 Award must be submitted to the Secretary of the American Pharmaceutical Association, 2215 Constitution Avenue, Washington 7, D. C., on or before January 1, 1950.

The nominations must be submitted in writing with eight (8) copies of each of the publications of the nominee dealing with his researches and eight (8) copies of a biographical sketch of the nominee including his date of birth and list of his publications. A nominee must be a resident of the United States or Canada. He must have accomplished outstanding research in the chemistry or pharmacy of iodine and its compounds as applied in pharmacy or medicine. During the period covered by the nomination the nominee shall have been actively engaged in, shall have completed, or shall have published a report upon the line of investigation for which the award is made.

Meet Our Contributors

John Joseph Ayash, M.D., was graduated from the American University of Beirut in Lebanon, served a residency at the Massachusetts Eye and Ear Infirmary in Boston, and was the recipient of a Cancer Research Grant in Boston in 1946. A specialist in otolaryngology, he serves on the staff of McCannel Clinic in Minot, N. D., and is a member of the Northwest District Medical Society and the A.M.A.

Harvey Brandon, M.D., a graduate of the medical school in Hamburg, Germany, specializes in internal medicine, and serves as assistant attendant physician at the City Hospital and as clinical assistant at Misericordia Hospital, New York City. He is a member of the New York County Medical Society and a Fellow of the A.M.A.

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John Francis Maloney, M.D., was graduated from Queens Medical College in 1941; took graduate work at the School of Tropical Medicine in California and the Lahey Clinic in Boston; is now assistant attendant physician at the Misericordia and New York City Hospitals, and clinical assistant in surgery at St. Vincent's, all in New York City. He is a member of the New York County Medical Society and the A.M.A.

Collin S. MacCarty, M.D., was graduated from Johns Hopkins Medical School, is now a neurosurgeon and instructor in neurological surgery at the Mayo Clinic in Rochester. He is a member of the A.M.A., the Harvey Cushing Society, the American College of Surgeons, the Neurological Society of America.

Charles A. McDonald, M.D., a graduate of Harvard Medical School, practices in Providence, R. I., as consultant at the Massachusetts General Hospital and the Rhode Island Hospital; visiting physician, department of medical psychology, Rhode Island Hospital; chief, department of neurology and psychiatry, St. Joseph's Hospital. He is a member of American Neurological Association, the American Psychiatric Association; American Psychopathological Association, Association for Research in Nervous and Mental Diseases, A.M.A. and Sigma Xi.

William J. O'Connell, M.D., Tufts Medical School, is on the staff of the University Health Services, Brown University, the Out-Patient Department of Medicine, Rhode Island Hospital, St. Joseph's Hospital, and the Charles V. Chapin Hospital, Providence, Rhode Island.

Hugh Grant Skinner, M.D., is a graduate of Queens University, and now directs the Pennington County Health Unit at Rapid City, South Dakota. He was a Life Insurance Medical Research Fellow in 1946-47 and assistant professor of pharmacology, University of South Dakota in 1947-48.

William K. Wright, M.D., a graduate of Northwestern University, took his internship at Cook County Hospital, Chicago, served an ENT Residency, Barnes Hospital, St. Louis; ENT Fellowship at Northwestern University, as assistant doctor, George E. Shambaugh Jr. Hospital; is now at the Fargo Clinic, N. D.

Book Reviews

Radiologic Exploration of the Bronchus, by S. DI RIENZO, Chief of the Radiology Department of the Institute of Cancer, The University of Cordoba, Argentina. Published by Charles C. Thomas, Springfield, Illinois, 1949.

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The author has succeeded admirably in his purpose of demonstrating abnormalities in bronchial anatomy and physiology by radiographic means. There are 466 figures in 319 pages and the pictorial method of presentation makes for interesting reading.

Practical embryology of the respiratory tract is discussed briefly and this is followed by chapters on bronchial histology and anatomy. The purposes of this discussion are to emphasize the importance of determining the conformation, segmentation and dynamism of the bronchial tree.

The bronchographic image of the normal bronchus is clearly explained. The anatomic characteristics are indicated by the calibre, outline and branching of the bronchus. The bronchophysiologic details are demonstrated by the filling rhythm, the bronchial tone and the mechanism of the muscular sphincter as well as the respiratory variation in calibre, the peristaltic waves and the effects of cough.

Technique of injection of contrast media is outlined in detail beginning with the preparation of the patient and ending with the position best suited to fill various lobes and segments. The type and technique of anesthesia is described meticulously. The author recognizes that there are occasional hazards including anesthetic reactions, hemorrhage and toxic reactions to the contrast media. The measures necessary to reduce these hazards to a minimum are discussed.

Tomography of the bronchus is considered a valuable procedure not only for the knowledge gained but because there is no contra-indication and no instrument or chemical substance is introduced. The author believes and rightly so that the relative merits of tomography, bronchography and bronchoscopy can never be determined since these methods complement each other and are not interchangeable. Tomography is especially indicated in those cases where the disease is in the trachea, primary bronchi or main lobar bronchi.

Bronchopulmonary malformations are considered important because of their unsuspected frequency and varied forms. The malformations that makes extrauterine life impossible are unimportant and are primarily of interest to the pathologist. The remainder frequently are not recognized unless superimposed infections supervene. These include lung agenesia, air cyst, alveolar agenesia, cystic bronchiectasis and bronchial diverticulum.

The relative importance of infection, bronchial obstruction, atelectasis and pulmonary fibrosis in the etiology of bronchiectasis has been widely discussed. The author believes the basis of acquired bronchiectasis is the development of obstruction in the terminal bronchi with the development of micro-atelectasis. The obstruction in the terminal bronchi is caused by infection, edema and secretions. The obstruction causes difficulty in expiration of air which is sharply intensified on coughing and bronchiectasis results. The author's explanation is rational but still does not eliminate infection and weakening of the bronchial wall as the initiating factor in certain cases. At times, bronchial obstruction may precede infection but in many cases infection antedates the obstruction.

In emphysema and asthma the principal change is in bronchial dynamism. The opaque substance is not "sucked in" by

the fine branches during respiration but remains mostly in the medium and large bronchi. The author further states that the opaque material has a tendency to form constant images instead of transient and changeable images, which is normal. The calibre of the secondary branches is smaller than normal, indicating spasm which reduces their lumen and dynamism. There is a scarcity of foliage.

Bronchography, tomography and bronchoscopy complement one another in the diagnosis of bronchial carcinoma. The author believes tomography should precede bronchography and that bronchography should precede bronchoscopy. The author does not believe bronchography need delay surgical intervention provided strict bronchographic technique is observed. Bronchography in lesions affecting only fine bronchi and small areas is probably useless. This type of examination is most beneficial where the carcinoma begins in a first or second order bronchus. The author emphasizes that radiologic exploration does not give images of absolute diagnostic value. It only gives information of the degree of canalicular patency and the characteristics of the obstruction of the bronchial branches.

The value of bronchography in hydatid cyst and pulmonary suppuration is discussed.

The student of diseases of the chest will be delighted with this book. The reproductions of roentgenograms are marvelous and the publisher deserves special praise for the excellent printing. A complete bibliography for each section is included. This volume is highly recommended to all physicians interested in diseases of the chest. S. C.

Outlines of Internal Medicine. Edited by C. J. Watson, M.D. In five parts. Sixth edition, 1949. Dubuque, Iowa: William C. Brown Co. Prices: Part I, $2.60; Part II, $1.95; Part III, $2.10; Part IV, $1.50; Part V, $1.85.

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The *Outlines of Internal Medicine* have been written by members of the faculty of the Medical School of the University of Minnesota and edited by the chief of the Department of Medicine. The outlines are used by junior and senior students as their text in medicine. Assigned readings of the Outlines serve the purpose commonly designed for didactic lectures; consequently time usually allowed for instruction by lecture may be used for demonstration and clinical teaching. By this pedagogical method, the head of the department—and each of the faculty—is aware of what the students are told about all subjects.

The Outlines are published in two formats: a set of five paper-covered, wire bound volumes, convenient for student use, a single cloth-bound volume, containing all five parts, suitable for reference and general reading.

Part I includes infectious diseases, pulmonary tuberculosis and other diseases of the lungs, allergic diseases and chronic rheumatoid disease.

Part II includes diseases of the blood; of the liver; biliary tract and pancreas; of the mouth, esophagus, stomach, duodenum, small intestine and colon.

Part III comprises lectures on heart failure; Bright's disease; electrocardiography; rheumatic fever and rheumatic heart disease; congenital heart disease; pericarditis; aortic stenosis; pulmonary arteriosclerosis; syphilis of the heart and aorta; hypertensive heart disease; arteriosclerosis of coronary arteries; cardiac arrythmias; and peripheral vascular diseases.

Part IV includes deficiency diseases; endocrine diseases; diabetes mellitus.

Part V is a manual of clinical chemistry and microscopy.

The sixth edition of the Outlines has been done by offset printing, a method which permits comparatively easy correction and revision. A revised or new edition of the Outlines has been issued about every year since the first writing in 1938. The material is presented in concise form, without extensive historical or literary background, but, except for a few tabular outlines, in finished, readable style. Suggestions for collateral reading are appended to each major section. The loose-bound separate volumes have blank pages interpolated for student's notes.

The information given in the Outlines is authoritative and well seasoned, and, although planned for undergraduate students, could profitably be assimilated by any busy practitioner.

J. B. C.

Blakiston's New Gould Medical Dictionary: *First Edition.* Editors, Harold Wellington Jones, M.D., Normand L. Hoerr, M.D., and Arthur Osol, Ph.D. With the cooperation of an editorial board and 80 contributors. 252 illustrations on 45 plates, 129 in color. The Blakiston Company, Philadelphia, Toronto, 1949.

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Blakiston's *New Gould Medical Dictionary* will be welcomed by physicians and those working in closely allied fields. This is not a revision or another edition of an old book, but an entirely new one; thus a first edition. This volume of 1294 pages was edited by three experts assisted by an editorial board of six persons and nearly one hundred contributors. Dr. Morris Fishbein, editor of the *Journal of the American Medical Association,* served as editorial consultant.

Such rapid and numerous advances have been made in medicine and closely allied fields during the past decade or so that many new words have appeared in the literature. These new words, together with their pronunciations, and meanings, are included in this dictionary. The present need for an up-to-date dictionary is greater than that of any other period during the past century except the last two decades of the 19th and the first decade of the 20th century when so much progress was made in determining etiology of various diseases as well as their treatment and prevention. One of the most progressive eras in the entire history of medicine with particular reference to accuracy of diagnosis, surgical techniques, chemotherapy and prevention has occurred during the past 15 years. Those who use this dictionary will be impressed by the tremendous volume of work which made it possible; for example, the clinical and systematic examination of over 300 standard modern tests reflecting current usage and nomenclature in all the basic fields of medicine, surgery and the biological sciences, as well as large numbers of journals, yearbooks and indices of specialties.

Tables and lists and illustrative plates, the abbreviations used in definitions, explanatory notes, notes on pronunciation found in the front of the book are helpful. Defined words are in bold blackface, legible type. Pronunciation is shown by syllable division and accent, and whenever necessary, by phonetic respelling.

There are 252 illustrations, of which 129 are in color, bound into the center of the book. An appendix of 137 pages is included, 80 of which are devoted to anatomical tables of arteries, veins, nerves, bones, joints and muscles. The remainder of the appendix contains excellent material on diets, hormones, medical signs and symbols, micro-organisms pathogenic to man, prescription writing, veterinary doses, vitamins, weights and measures. This dictionary should be made available to every medical student and physician as well as all working in closely allied fields. J. A. M.

1949 Year Book of Medicine. Edited by Paul B. Beeson, M.D., J. Burns Amberson, M.D., George R. Minot, M.D., William B. Castle, M.D., Tinsley R. Harrison, M.D., and George B. Eusterman, M.D. 832 pp.; 139 illustrations. Chicago: The Year Book Publishers. Price, $4.50.

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The *1949 Year Book of Medicine* is now available, somewhat earlier than the annual publication date. The abstracts of the literature of infectious diseases, diseases of the chest, heart, gastro-intestinal tract—including liver, biliary system and pancreas, and of the blood have been well chosen and ably edited by Drs. Beeson, Amberson, Minot and Castle, Harrison and Eusterman. The pithy editorial comments, characteristic of *Year Book* compendiums, enhance the value of the original contributions, often by criticism or disagreement.

Subjects particularly emphasized are: Antibiotics and chemotherapy for infectious diseases; cytologic examination of sputum in diagnosis of lung cancer; vitamin B_{12} for pernicious anemia; nitrogen mustards, urethane, stilbamidine and aminopterin for therapy of Hodgkin's disease, multiple myeloma and leukemia; bone marrow studies; agglutination, immunological and other blood group and type phenomena; coagulation of blood and anticoagulants; potassium metabolism; diagnosis of congenital heart disease. Careful perusal of this *Year Book* should furnish satisfactory knowledge of matter for practical application derived from work now being done in the several medical specialties. J. B. C.

Classified Advertisements

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Advertisers' Announcements

Ciba's Carmethose for Ulcers

A new type of antacid demulcent for improved therapy of peptic ulcers is being made available to the medical profession by Ciba Pharmaceutical Products, Inc., under the trade name of Carmethose. Tablets of Carmethose are small, easily swallowed and tasteless. Each tablet contains a synergistic combination of 225 mg. of sodium carboxymethycellulose and 75 mg. of magnesium oxide.

Carmethose provides prolonged control of ulcer symptoms with no adverse effects. It acts in two ways: by reducing gastric acidity and by providing a tenacious, mucin-like coating of the mucosa and ulcer crater. It has been observed gastroscopically in the stomach for as long as three hours. Carmethose forms a non-absorbable, hydrophillic gel. It will not cause secondary hyperacidity, has no effect on the electrolytic or acid-base balance, does not interfere with digestion, does not cause diarrhea and aids in normal elimination. Two to four tablets of Carmethose should be taken four to six times a day, spaced between meals. The tablets should be taken with a glass of water or milk and should not be chewed.

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This is a combination of penicillin and benzocaine for corrective action and symptomatic relief in the local treatment of oral infections, placed on the marked by Schieffelin & Co., New York. The formula of each troche is as follows: Penicillin, 5,000 units; benzocaine, 21.59 gm.

These troches are used for the treatment of Vincent's infection, pericoronitis and other minor cental infections by both physicians and dentists. Penicillaine Troches Schieffelin are also recommended for the alleviation of pain incident to tissue damage caused by superficial erosion or manipulative procedures. Dosage is simple and convenient. One troche is dissolved slowly in the mouth every one or two hours as directed by the physician or dentist. The frequency and duration of the dosage, naturally, will determine the effectiveness of the treatment. Penicillaine is supplied in vials of 15 troches.

DEPO-PENICILLIN APPEARS

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Finally, in Depo-Penicillin the suspension is permanent so that uniform dosage is insured. The Upjohn Company supplies Depo-Penicillin in 10-cc. size rubber-capped vials and in 1-cc. size cartridges with disposable syringe.

SQUIBB'S TOLSEROL, MUSCLE RELAXANT

Tolserol, 3-ortho-toloxy-1, 2-propanediol, known in Britain under the proprietary name of Myanesin, has been placed on the market in this country by E. R. Squibb & Sons.

Tolserol is a synthetic chemical compound which exhibits profound muscle-relaxing properties. It appears to be useful in alleviating symptoms of certain spastic and neuromuscular disorders, improving functions or restoring them to normal in a number of such patients, and is believed to open a new field of therapy in the treatment of these disorders.

In patients who are benefited, Tolserol medication tends to reduce exaggerated reflexes to normal without affecting normal reflexes. Thus, spasticity may be ameliorated without interfering with normal movement. Berger and Schwartz report (J.A.M.A. 137:722, 1948) that, in spastic and hyperkinetic states, Tolserol produces benefits greater than those ascribed to any other known remedy.

Orally, even in high dosages, Tolserol is free from toxic effect. Tolserol metabolizes rapidly in the body. Because absorption from the gastrointestinal tract is slow, administration of large oral doses does not result in high blood levels.

Tolserol is supplied in 0.25 Gm. tablets, in bottles of 100 and 1000.

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Not infrequently babies resist the first feeding of egg. The mixing of Pablum or Pabena with soft-boiled egg when this important food is offered to the infant for the first time may overcome this initial resistance. After the soft-boiled egg is opened and the contents are placed in a cup, stir from 1 to 3 level tablespoons of Pablum or Pabena, depending on the consistency desired. This makes a uniform mixture.

For literature and professional samples of Pablum and Pabena, write Mead Johnson & Company, Evansville 21, Indiana.

CORICIDIN SUCCESSFUL AGAINST COMMON COLD

Coricidin tablets, for aborting and treatment of the common cold, are now available from Schering Corporation, pharmaceutical manufacturers of Bloomfield and Union, N. J. It is the first preparation using the combined antihistaminic-analgesic-antipyretic attack against coryza.

The principal ingredient in Coricidin is Chlor-Trimeton, Schering's new, potent antihistaminic drug. Each Coricidin tablet contains 2 milligrams of Chlor-Trimeton. Included are adequate amounts of acetylsalicylic acid, acetophenetidin and caffeine which contribute their well known analgesic-antipyretic synergistic effects.

There is a relatively new concept of the cold, understood and investigated by several clinicians in the last few years: "The common cold is an allergic response in susceptible persons to

The JOURNAL LANCET

Minneapolis, Minnesota
December, 1949

Vol. LXIX, No. 12
New Series

A Study of 258 Cases of Appendicitis Based on Pathological Findings*

Henry B. Wightman, M.D.
Ithaca, New York

At college and university health services, appendicitis is one of the common surgical conditions encountered. The diagnosis is at times difficult. Although the surgical treatment has changed in recent years, the symptom complex leading to the diagnosis has remained essentially the same. This study was undertaken to review this symptom complex in light of the pathologist's findings.

From September, 1940 until September, 1948, a period of eight years, all appendices removed at operation have been sent to the pathologist for his opinion as to extent of involvement. In the eight-year period, 274 appendectomies have been performed at the Cornell Infirmary. Sixteen cases were omitted because of insufficient data, leaving the data of 258 cases as the basis of this study. The pre-operative records were reviewed, and the clinical and laboratory findings were correlated with the pathological diagnoses.

The group is composed of 197 males and 61 females. This approximate three male to one female ratio has been present during the eight years in a student body where the total enrollment has varied from 7,500 to 9,500. Proportionately, the sexes seem affected with equal frequency. The number of appendectomies performed per year has varied from 17 in 1946 to 55 in 1944.

Pathology. Of the 258 appendices examined by the pathologist, 182 or 70 per cent were listed as "acute", 38 or 14.5 per cent as "subacute", and 38 or 14.5 per cent as "no diagnosis". In the "acute" group are those described as "acute suppurative", and "acute gangrenous." In the "subacute" group are those described as "subacute", "fibrous", and "chronic".

TABLE I

Acute	182 (70%)
Subacute	38 (14.5%)
No diagnosis	38 (14.5%)

Monthly Incidence. The highest incidence is in the month of March and the lowest in July. Account must be taken of the fact that the university enrollment in the summer is less than in the winter, and a vacation of a week in December at Christmas and of a week in late March or April would influence the total number occurring in these months respectively. The corn season in late summer and the cider season in early fall have been suspected as a cause of enteritis and possible appendicitis. The figures do not confirm this suspicion. There seems to be more association with the enteritis combined with respiratory symptoms so common in health services during the winter months.

TABLE II

January	23	May	26	September	14
February	17	June	17	October	16
March	41	July	13	November	20
April	26	August	19	December	26

*From the Department of Clinical and Preventive Medicine, Cornell University, Ithaca, New York.

History. Practically all the cases had pain in the abdomen. The original site of the pain, the shifting of the pain from one region of the abdomen to another, and the ultimate localization of the pain was thought to be important. This sequence fitted into three general headings: (1) those beginning in the epigastrium and localizing in the right lower quadrant; (2) those beginning in the lower abdomen and going to the right lower quadrant, and (3) those beginning as epigastric and remaining that way. The pain of 58 per cent of the "acute" group (Table I) started in the epigastrium and progressed to the right lower quadrant, whereas 25 per cent and 22 per cent of the "subacute" and "no diagnosis" groups followed this pattern. In the two latter groups, the pain in 56 per cent and 62 per cent respectively, begins in the lower abdomen and shifts to the right lower quadrant. This difference is shown in Table III and will be commented upon below.

TABLE III

	Acute	*Subacute*	*No Diagnosis*
Epigastric to R.L.Q.	94 (58%)	8 (25%)	7 (22%)
Lower abdomen to R.L.Q.	34 (21%)	18 (56%)	19 (62%)
Epigastric	33 (20%)	6 (19%)	5 (16%)
Cases where history was definite	161	32	31

Symptoms. Nausea exists with equal frequency in the "acute" and the "subacute" group. Vomiting was present more often in the "acute" group, whereas diarrhea occurred in proportionately few (Table IV). This compares with the cases reported by Quigley and Contralto,[1] where in acute appendicitis vomiting was present in 38 per cent and diarrhea in 4 out of 60 (6.6 per cent) of their cases.

TABLE IV

	Acute	*Subacute*	*No Diagnosis*
Nausea	96 (53%)	20 (52%)	15 (39%)
Vomiting	58 (22%)	6 (15%)	6 (15%)
Diarrhea	21 (11%)	3 (8%)	3 (3%)

Pain—relation to nausea. This relationship was investigated and it was found that 88 or 49 per cent of the cases in the "acute" group had pain before the nausea. In the "subacute" and the "no diagnosis" groups, only 18 per cent described their symptoms this way.

Pain—duration before operation. There is a shorter duration of pain in the acute group as shown in Table V.

TABLE V

	Acute	*Subacute*	*No Diagnosis*
24 hours or less	123 (67%)	12 (37%)	6 (19%)
More than 24 hours	59 (31%)	20 (63%)	26 (68%)

Temperature. The highest preoperative temperature was recorded. The initial reading was taken rectally and a degree was subtracted to conform to other readings. On observing the figures in Table VI, it is seen that the three groups are essentially similar.

TABLE VI

	Acute	*Subacute*	*No Diagnosis*
Below 99°	76 (42%)	17 (45%)	23 (60%)
99° to 100.8°	95 (52%)	20 (52%)	11 (34%)
101° or above	11 (6%)	1 (3%)	2 (6%)

Pulse Rate. Here again the highest preoperative reading is noted. Eighty beats per minute were arbitrarily taken as a possible high normal. The findings listed below are seen to be similar.

TABLE VII

	Acute	*Subacute*	*No Diagnosis*
80 beats per min. or below	58 (32%)	15 (39%)	13 (36%)
Above 80	124 (68%)	23 (61%)	23 (64%)

Leucocytosis. Here the highest preoperative blood count is recorded. There is a much higher percentage of blood counts of over 13,000 per cu. mm. in the "acute" group. The number of cases in the "acute" group (34 per cent) showing a count of over 20,000 per cu. mm. was greater than expected. Possibly young adults have a greater leucocyte response because of their age and general good health.

TABLE VIII

	Acute	*Subacute*	*No Diagnosis*
13,000 or below	26 (14%)	20 (54%)	17 (54%)
13,000 to 20,000	95 (51%)	11 (29%)	9 (24%)
Above 20,000	61 (34%)	0	0

Polymorphonucleosis. Eighty per cent polymorphonuclears was arbitrarily taken as evidence of true polynuclear response. Here the chart below shows that 60 per cent of the "acute" group had more than 80 per cent polynuclears, whereas the figures for the other two groups are 29 per cent and 33 per cent respectively.

Physical Signs. Abdominal tenderness is present in nearly all the cases. There is a much higher incidence of muscle guarding or spasm in the "acute" group.

TABLE IX

	Acute	*Subacute*	*No Diagnosis*
Polys 80% or below	74 (40%)	22 (71%)	18 (66%)
Above 80%	108 (80%)	9 (29%)	9 (33%)

Complications found at operation. In the "subacute" group, 22 or 58 per cent had evidence of bands, kinks,

and adhesions or fecoliths at operation. In the "no diagnosis" group, 11 or 29 per cent had such evidence.

Table X

	Acute	*Subacute*	*No Diagnosis*
Tenderness	178 (99%)	35 (92%)	33 (89%)
Spasm	123 (67%)	16 (42%)	15 (45%)

Comment

This study of 258 cases was made after eight years' data had accumulated. By correlating preoperative symptoms and signs, certain trends are evident. A number of questions are raised, some of which are: How accurate are clinical observations as checked with pathological diagnoses? Do the facts bear out the impressions regarding temperature, pulse, and leucocytosis? How important is a carefully taken history in relations to nausea, vomiting, and diarrhea? Is the progressive location of the pain and its ultimate localization verified in comparing preoperative diagnoses and pathological reports?

All cases operated upon were studied and were thought to warrant surgery. It is the general policy at the Cornell infirmary to perform an appendectomy even though the indications are not absolute. It is felt justified for two reasons: (1) The operative risk is slight, and (2) Since appendicitis sometimes is very atypical in its signs and symptoms, occasionally an acutely inflamed appendix is found, the degree of involvement being unsuspected before operation. In the "no diagnosis" group, there were 27 cases (10.4 per cent) where no complications such as kinks, adhesions, bands, or fecoliths were found at operation. This compares favorably with a series of 1,100 cases reported by Rosenberg [2] in which 100 cases showed no pathology in the appendix. No attempt was made to follow up these cases to determine the degree of symptomatic relief experienced.

Preoperative pulse rate and temperature are of little value in distinguishing the three groups. However, leucocytosis is decidedly higher in the "acute" group as well as the percentage of polymorphonuclear leucocytes.

Nausea was present with equal frequency in the three groups. Vomiting was more prevalent in the "acute" group, whereas the complaint of diarrhea occurred in less than 10 per cent of the groups and was of little diagnostic aid.

A carefully taken history with particular attention to the sequence and progression of the pain seemed to be of value. This follows the teachings of the late Dr. John B. Murphy, writing in Keen's Surgery, in which he states,[3] "The symptoms of appendicitis are at first pain in the abdomen, sudden and severe, primarily referred to the epigastrium, followed by nausea and vomiting, most commonly three to four hours after the pain." This sequence was observed in 58 per cent of the cases listed above as "acute", and in only 25 per cent of the other two groups. Pain preceded the nausea in 49 per cent of the "acute" group and in only 18 per cent of the other groups. The original site of the pain, its ultimate localization in the right lower quadrant, and the observation that the pain precedes the nausea, all noted by Dr. Murphy some time ago, are brought out in this statistical analysis.

Summary

1. 258 appendectomies are analyzed after pathological diagnosis.

2. The cases are studied from the history, temperature, pulse, and leucocyte response.

3. The importance of the pain, its original site and subsequent localization, and its relation to nausea and vomiting is emphasized.

4. Muscle spasm is a more important physical sign than tenderness in distinguishing the "acute" from the "subacute" cases.

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1. Quigley, T. B., and Contralto, A. W.: Differential diagnosis of appendicitis with gastroenteritis in college men. New Eng. J. of Med. 226:787-790, 1942.

2. Rosenberg, N.: Syndrome of acute appendicitis, Amer. J. of Surg. 58:365-367, 1942.

3. Keen's Surgery; vol. IV, p. 750. W. B. Saunders Company, 1908.

An improved cancer case-finding aid may be evolved from a technique used in the instantaneous processing of radar photographs. An Army invention, the process has potential value in the rapid examination of individuals for cancer of the stomach. Instantaneous processing of photofluorographic films will reduce the cost of x-ray screening for signs of early gastric cancer. Development of this equipment will be under the supervision of Dr. Russell H. Morgan, professor of radiology at Johns Hopkins University, Baltimore, Md.

Acute Pancreatitis

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EARLY anatomists, among them Galen and Vesalius, considered the pancreas only a cushion to support and protect the stomach and other organs. In 1641 Moritz Hoffman discovered the main pancreatic duct in the rooster. He conveyed his discovery to Wirsung who demonstrated it in the human pancreas. G. Dominici Santorini first described the accessory pancreatic duct. Bidloo first noted the papilla common to both the pancreatic and bile duct. Many anamolous ducts were soon being reported and it was Meckel's significant statement that atrophy of the duodenal end of the accessory duct was the developmental rule and this fact accounted for the many anomalies.

Mettler [27] states that pancreatic removal had been experimentally practiced by the Dutch surgeons in the 18th century and similar experiments were repeated in the 19th century. Thus, Nicholas Senn (1844-1908) explored the possibility of pancreatic surgery in 1886. Moring and Minkowski [26] did experiments in 1889 that were definitely superior to all of the earlier work. Their classic experiments were concerned with total pancreatectomy in the dog and observations in the diabetic course of the animals. Their article is of further historical interest because it was one of the first in experimental operative procedures in which comments were included upon bacteriology and operative asepsis.

Lancereaux first suggested the possibility that gallstones lodged in the ampulla of Vater could cause disease of the pancreas by obstructing the main pancreatic duct. Korte in 1898 noted the frequent association of biliary tract disease and pancreatitis.

Balser [4] first described the presence in pancreatitis of nodules and patches of necrotic fat tissue in the mesentery. Reginald Fitz [17] of Boston in 1889 wrote the first description of acute pancreatitis. This paper is a classic and at that time it aroused a great deal of interest in the subject. No surgical treatment was practiced, however, on the cases reported by Fitz, and many of his observations were completed at autopsy after a long and difficult illness was terminated.

It is obvious that the historical aspects of acute pancreatitis should include the earlier work on the sphincter of Oddi. Glisson was one of the first anatomists to describe annular fibers surrounding the outlet of the common duct. His work, however, was without confirmation. Gage, in America, was the first to demonstrate these fibers microscopically. He showed circular fibers around the distal common bile duct and the pancreatic duct, and a few fibers common to both ducts. His work was done with the cat. Oddi [29] in 1887 and 1889 demonstrated the same muscle bundles in human autopsy specimens. In 1911, Archibald,[3] unknowingly reported some of Oddi's anatomical work. He did, however, make important physiological contributions on the sphincter mechanism. His work was done with dogs.

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ANATOMY

This phase of the subject will be sharply limited to the terminal end of the major pancreatic duct and to the terminal end of the common bile duct. It is the anatomical relationship of these two systems that has so much to do with the occurrence of acute pancreatitis. Glisson first described and Gage, Hendrickson [20] and Oddi [29] demonstrated the distal common bile duct to be surrounded by a distinct smooth muscle bundle, independent of the intestinal muscle and apparently arising from the duct itself. Oddi called this bundle the sphincter du choledoque. He also actually demonstrated inconstant sphincter fibers around the distal pancreatic duct.

Boyden [22,7] has contributed very complete details of the intrinsic musculature of the ducts and ampulla. The components are as follows:

(1) The sphincter choledochus
(2) The longitudinal fascicles
(3) The sphincter pancreaticus
(4) The sphincter ampullæ

The sphincter choledochus is the most highly developed of the intrinsic muscle of the ducts. It encircles a much longer segment of duct than usually considered and extends from the slit-like opening in the circular muscles of the duodenum that admits the common duct to the juncture of the common and pancreatic ducts. When contracted it can prevent the passage of bile into the duodenum. When contracted alone, however, the ductus choledochus does not produce a "common channel." The sphincter pancreaticus is a smaller bundle at the distal end of the pancreatic duct. It is present in 30 per cent of individuals. The sphincter ampullæ surrounds the ampulla and the distal pancreatic and bile ducts. By its contracting, bile and pancreatic juice are blocked, and bile may flow into the pancreatic duct or pancreatic juice may flow into the common duct. Boyden found the sphincter ampullæ to be well developed in only 17 per cent of individuals. This incidence agrees with a frequency of 23 per cent of reflux into the major pancreatic duct as shown by Leven [24] with cholangiograms. The longitudinal fascicles are two bundles situated between the common and pancreatic ducts and has to do with erection of the papilla.

The anatomical relationship of the distal choledochal and pancreatic ducts has long intrigued workers in this field. The relative occurrence of the "common channel" has long been a source of disagreement. Opie [30] found

a common opening in 89 per cent of autopsy specimens but pointed out that a common channel did not necessarily mean that the common and pancreatic duct could be converted into a freely communicating system by an impacted biliary calculus. He decided that in only 30 per cent of cases could reflux be caused by a distal obstruction. Judd decided after a study of 170 necropsy specimens that a common channel could exist in only 4.5 per cent of specimens. Mann and Giordano [25] pointed out that a common channel could be created only in specimens in which the length of the ampulla was greater than its diameter. This occurred in only 3.5 per cent of the specimens examined by them. Cameron and Noble [9] concluded from detailed and ingenuous experiments that in 66 per cent of specimens it was anatomically possible to convert the biliary and pancreatic systems into a common channel. They prepared their specimens by impacting a 3 mm. gallstone into the ampulla, pouring Wood's metal into the system, and thus obtaining casts of the injected system. Their figures contrast sharply with those of Judd and with those of Mann and Giordano. The latter two investigations were carried out with fixed specimens while those of Cameron and Noble were done with fresh specimens. At the present time it is felt that the figures of Cameron and Noble are more nearly correct. Rienhoff and Pickrell [34] have recently studied the problem again. They felt that a common channel should not be so called if it is less than 2 mm. from the end of the septum between the two systems to the summit of the papilla. With this criteria they found that in 32 per cent of specimens a common channel exists of a length (over 2 mm.) to suggest the possibility of regurgitation from one system to another. These latter figures seem at least to be a compromise between the two widely divergent opinions expressed above.

Definition

Acute pancreatitis in its several forms is entirely different in clinical course and ultimate prognosis. One must be aware of this difference in interpretation of the literature. Only recently have observers become aware of the milder form, the so-called acute edematous or interstitial pancreatitis as compared to the long recognized acute hemorrhagic pancreatitis, or acute pancreatic necrosis, as it is sometimes known.

Abell [1] and Gonshorn [18] believe that acute edematous pancreatitis is merely a step in the development of acute hemorrhagic pancreatitis. Robinson and Alfenito [36] simply divide the disease into the hemorrhagic and nonhemorrhagic types. Archibald,[3] in 1919, insisted that the more severe form of pancreatitis should be called acute hemorrhagic necrosis of the pancreas. He found that the essential pathological lesion was a necrosis of pancreatic cells or masses of cells, with hemorrhage, gangrene and suppuration occurring secondarily. No doubt Archibald was correct regarding the severe form of the disease, but he failed to recognize a milder form of pancreatitis as a distinct clinical entity. R. Fitz [17] in 1889 gave the first accurate description of acute hemorrhagic pancreatitis and since then the disease has held a prominent place in medical literature and a great deal of study has been carried out in an attempt to clarify the etiology and pathogenesis. Most of this work has been directed toward acute hemorrhagic pancreatitis as opposed to acute edema of the pancreas. Jones [21] pointed out in 1943 that there were two distinct forms of the disease with an almost identical onset but being quite different thereafter. In 1924 Zoepffel [40] had differentiated four cases of acute edema of the pancreas seen at operation, from seven others characterized by hemorrhage and necrosis of the pancreas. In 1933 Elman [15] collected from the literature, 33 cases of acute edema of the pancreas. He added four cases of his own to establish a pathological and clinical entity, the undoubted occurrence of a special type of acute pancreatic disease, tentatively designated as acute interstitial pancreatitis or acute edema of the pancreas. This type of pancreatitis is characterized by the presence of edema, swelling and induration of the gland, and without necrosis, hemorrhage, or suppuration. Thus, since Elman's description in 1933, this milder form of pancreatitis has been recognized as a distinct clinical entity.

It is important to remember that when a great deal of the investigative work was being done, the edematous type of pancreatitis was unknown. This probably contributed to discrepancies in the literature, particularly in case fatality statistics.

Etiology

Without giving credence to any specific factors it is well to first study an outline of the factors usually considered in the etiology of acute pancreatitis. This table is adapted from R. Jones, Jr.[21]

Classification of Etiologic Factors in Acute Pancreatitis

I. *Pancreatitis of Infectious Origin.*
   - A. Lymphogenous.
   - B. Hematogenous.
   - C. Extension via pancreatic ducts, from duodenum or bile ducts.
   - D. Direct extension from infective foci or adjacent viscera.
   - E. Activation of enzymes by bacteria in normal gland.

II. *Pancreatitis of Non-infectious Origin.*
   - A. Reflux into pancreatic duct of
     1. Bile—"common channel", as caused by stone, edema, or spasm of sphincter of Oddi.
     2. Duodenal contents.
   - B. Obstruction of Pancreatic Ducts by epithelial hyperplasia, stone, tumor, or edema.
   - C. Trauma.
   - D. Vascular accidents.

III. *Combination of Factors.*

It is obvious from the above outline that the modus operandi is not clear, however, certain factors are more than an incidental finding. These factors, singly or in combination, seem to have a relationship to the development of acute pancreatitis in the majority of cases. They

will be discussed in detail later in the text. These factors are:

I. A "common channel" mechanism. According to Jones,[21] this mechanism was present in an average of 60 to 70 per cent of collected autopsy reports. In addition, two other factors must exist, i.e., there must be an obstruction to the outflow of bile into the duodenum and pancreatic enzymes, must be activated either in the pancreatic or biliary ducts.

II. There is a frequency of associated biliary disease in acute pancreatitis. Backus[6] states that the collected reports reveal an association of the two diseases in 70 per cent of cases of acute pancreatitis. Wangensteen et al believe that if there is any common denominator of acute pancreatic necrosis it is gallstones or chronic disease of the gallbladder.

III. Acute bouts of alcoholism and dietary debauches seem to be the initiating factor in some attacks of acute pancreatitis.

Lancereaux first suggested the possibility that gallstones lodged in the ampulla of Vater could cause disease of the pancreas by obstructing the main pancreatic duct. Since Opie's[30] classical autopsy finding in 1901 in Halsted's Clinic of a common duct stone producing a "common channel," the argument has continued regarding the relationship of biliary disease to pancreatitis.

As stated previously, Judd and Mann and Giordano[25] felt that the "common channel" arrangement was seldom present, whereas Opie,[30] Cameron and Noble[9] and Rienhoff and Pickrell[34] concluded that it was present between 30 to 60 per cent of cases. At the present time it is generally concluded that the "common channel" is often present and is an etiological factor in acute pancreatitis. Of greater practical importance, however, is the occurrence of the "common channel" mechanism in cases that actually have the disease. This frequency is not known at the present time.

Opie believed that a common duct stone was the precipitating factor in the disease by its blockage of the "common channel" mechanism. Time has proven him to be wrong. Thus in Van Schmieden and Sebening's series of 1278 cases of acute hemorrhagic pancreatitis collected from Germon Clinics, Opie's classic findings were noted in only 4.4 per cent of cases. These findings have been borne out in this country.

The sphincter spasm mechanism as first described by Archibald[3] (in cats) is gaining current popularity. It was refuted by Mann and Giordano since they found such a low percentage of common channel specimen, they were unable to postulate a "common channel" mechanism on the basis of spasm, causing regurgitation into Wirsung's duct. Culp and Doubilet[11,12] and Leven[24] found with routine cholangiography, however, that a filling of the duct of Wirsung occurred in 20 per cent of cases. Lanshorn[18] states that 50 per cent of cases of acute pancreatitis are associated with chronic biliary disease, usually chronic cholecystitis with stones. Paxton and Payne,[31] in 1947 reported the largest single group, a total of 307 cases seen in a 14 year period. They agree that biliary disease is present in over 40 per cent of cases. In 5 per cent of cases a common duct stone is present and probably in a larger group there is a spasm of the sphincter of Oddi with reflux of bile into the pancreatic duct. Paxton and Payne found that 25 per cent of cases of acute pancreatitis have their onset after a heavy meal. There is a past history of pancreatitis in 43 per cent. Eighteen per cent are intoxicated or recovering from a recent debauch.

PHYSIOLOGY

The pancreas secretes three ferments, amylase, lipase and trypsin. These act respectively upon carbohydrates, fats and proteins. With regard to the first, it is constantly present in pancreatic juice, and cannot be said to be diagnostic of pancreatic fluid inasmuch as it occurs in fair quantity in other fluids, as for example, the ascitic fluid. Lipase has been reported present in most cases of pancreatic cyst fluid and fistula fluid. The main attention, however, is focused on trypsin and the proteolytic activity of pancreatic juice. Aldis[2] notes that the literature varies in reporting the tendency of pancreatic juice of an external fistula to produce digestion of the abdominal wall. In some cases it has been a major problem, in others it has been no problem at all. The traditional explanation is that trypsin is inactive until it comes in contact with the specific enzyme, enterokinase of the duodenal secretion. Support of this is given by the extensive tissue destruction of a duodenal fistula. Thus, theoretically, a pancreatic fistula would not have proteolytic activity. Since such a fistula is locally destructive at times, it must be presumed therefore that substances other than enterokinase can activate the trypsinogen. Thus calcium chloride, exposure to air, bacteria, bile, and bile salts are at times effective in splitting up the trypsin-inhibitor complex.

Morton[28] states that the origin of the normal blood content of amylase is unknown. It is absent in the newborn; appears at 2 months; is measurable at 3 months; and reaches a normal level in one year. It is not influenced later by age, sex, amount or type of food, fasting, dehydration, diuresis, exercise, or sleep. Acute pathological conditions in the salivary glands or pancreas cause a quick rise and quick subsidence to normal levels. Injury to the pancreas increases the level; injury to the liver or kidney decreases the level.

Popper and Necheles[32] cannulated the thoracic duct in three dogs and occluded the portal vein in a fourth. They then determined the amylase and lipase activity of the portal blood, peripheral blood, and the lymph. They concluded that the main pathway of pancreatic enzymes into the peripheral blood following injury to the pancreas was by way of the portal vein and to a much lesser degree through the lymph into the thoracic duct.

Archibald[3] demonstrated that the sphincter muscle (in dogs) could resist a pressure of 60 cms. of water and that it could be put into spasm by duodenal or gastric irritability. He also demonstrated that a vagotomy provoked an intense and prompt spasm of the sphincter. Archibald demonstrated that by sphinctotomy this pres-

sure could be reduced from 60 to 7 cms. of water, and that this reduction was permanent for at least eight weeks. Bergh [5] has shown that the measurements in humans reveal the "normal" sphincter resistance to be between 9 and 15 cms. of water.

Morton [28] states that pancreatic ferments do not affect living tissues. Sterile pancreatic juice has been injected intraperitoneally and intravenously without any harmful effects. Bile injected into pancreatic ducts causes pancreatic necrosis by its local cytolytic and destructive properties and not because of the activation of intraductal trypsinogen. Active trypsin cannot digest living tissue; it acts as a catalyst in facilitating the hydrolysis of protein by the alkali of the pancreatic juice. The local destructive action of pancreatic juice is dependent on the concentration of the alkali of the juice. Infected bile is more destructive than sterile bile. The toxic effect is neutralized by the proteins of the blood serum. Hemorrhage is believed by Morton [28] to be a protective mechanism but few observers agree.

Pathogenesis

It is now generally accepted that the pathological changes of acute pancreatitis are caused by the effect of activated ferments on the pancreatic tissues. The exact manner in which these ferments act is a moot point. It is thought that the entrance of bile into the duct of Wirsung is the most likely immediate cause.

Many observers believe that the bile causes the activation of trypsinogen into trypsin with autodigestion of the pancreas. Dragstedt [13] and his workers could find no support of the above thesis. They felt that the already present lipase in the pancreas acted upon cellular lipoids and accounted for a great deal of tissue destruction. Bradley [8] had previously demonstrated that the bile salts are strong cytolytic agents and that the pancreas is particularly susceptible to the cytolytic action of bile. Dragstedt and his workers therefore inferred that the reaction between bile salts and pancreatic cells resulted in frank exudation or frank hemorrhage. It is true that infection plays a part, since experimentally, infected bile provokes a much greater pancreatic reaction when injected into the pancreatic ducts, than does non-infected bile. A higher concentration of certain elements of the bile, the taurocholates for instance, likewise provokes an increased pancreatic response.

Gonshorn [18] believes that when pancreatic secretion leaks into the substance of the gland, the lipase digests fats and causes typical fat necrosis. The trypsin, resulting from activation of trypsinogen by intercellular juices, without the presence of enterokinase, causes a digestion of the tissues and vessel walls with necrosis and hemorrhage. The mildness and severity of the clinical attack is directly proportional to the amount and nature of the escaping pancreatic juice. In the mild form, there is a small leak, the secretion contains little trypsin; there is edema from irritation and some fat necrosis, but no necrosis of the pancreas and no hemorrhage. In the severe hemorrhagic type, there is an escape of secretion rich in trypsin, such as is found after a large meal or alcoholic debauch. The secretion therefore causes a greater digestion and necrosis. If large vessels are in the vicinity, their walls are digested and an active hemorrhage occurs in and around the gland.

Acute pancreatitis was produced in dogs by Chisholm and Seibel [10] according to the method used by Rich and Duff.[35] Thus, fresh bile was injected through the cannulized duct of Santorini. Changes occurred in the pancreas immediately and were observed under direct vision. A small volume of bile injected under low pressure produced what would be comparable in man to acute edema of the pancreas. A larger volume injected with a higher pressure, i. e., over 18 cms. of water, produced an acute hemorrhagic pancreatitis, followed shortly thereafter by areas of fat necrosis.

Rich and Duff [35] have done much to re-establish the trypsin theory in the pathogenesis of acute hemorrhagic pancreatitis. In autopsy slides they found vascular lesions which were described as being indistinguishable from those seen in the kidneys in a case of malignant nephrosclerosis. They experimentally produced the lesions in dogs by injection of bile and pure trypsin, and concluded that the lesion, viz., areas of focal necrosis in the media and adventitia, was due to direct action of trypsin on the vessel wall. They found that this lesion could be produced by pancreatic juice containing inactive trypsinogen. Although a great deal of their work depends on interpretation of microscopic changes, it has not been refuted. Since this work, few additional studies of this aspect of the problem have appeared in the literature.

In summary, although the question is not settled beyond doubt, it can be said that the release of active trypsin into the interacinar tissue is the factor of prime importance in the pathogenesis of acute pancreatitis. If trypsin comes into contact with a vessel wall it causes hemorrhage and this furthers the process by damaging tissue and releasing more trypsin.

Pathology

In 1889 Fitz [17] wrote an article in the Boston *Medical and Surgical Journal* entitled, "Acute Pancreatitis: A Consideration of Pancreatic Hemorrhage, Hemorrhagic, Suppurative and Gangrenous Pancreatitis and Disseminated Fat Necrosis." This was the first comprehensive discussion of this acute pancreatic catastrophy. Rather than the term "acute hemorrhagic pancreatitis," it is known now that a variety of inflammatory manifestations occur in the pancreas. The hemorrhage tendency and occurrence of necrosis are related to the reaction of activated pancreatic enzymes. In the absence of necrosis and hemorrhage, the pancreas may be the seat of a gross edema only. On the other hand, severe edema may be followed by suppuration; and indeed, edema, suppuration, hemorrhage, and necrosis may be associated together in any combination or may occur in sequence.

When the abdomen is opened in acute pancreatitis, a blood tinged fluid is often encountered. White, firm areas of so-called "fat necrosis" may be seen. These areas are seen on the pancreas omentum, surrounding

viscera, and parietal and visceral peritoneum. They are caused by the hydrolysis of neutral fat by activated pancreatic enzyme, into glycerin and fatty acids; the acids combine with calcium to form insoluable soaps. (R. Langerhaus, 1899.)

Edmondson and Berne [14] further investigated the calcium changes in acute pancreatic necrosis. They studied the total calcium content of the lesions of fat necrosis around the pancreas. These lesions were excised at autopsy and found to contain from 200 to 1732 mgs. of calcium by actual weight. No serious cases were seen in which the serum calcium was not lowered. Death occurred in all cases in which the serum calcium fell below 7 mg./100 cc.

As stated above, any stage or combination thereof of inflammation of the pancreas may occur in acute pancreatitis. The organ may appear large, dark, soft, and hemorrhagic. Gradually it may appear to be replaced in part or whole by extensive necrosis or a suppurative process. It may be a simple diffuse edematous involvement. If recovery from an initial severe attack has occurred at a later date, the pancreas may be the site of cyst or abscess formation. As an aftermath of repeated sub-lethal attacks, the pancreas may be extensively fibrotic and calcium will be laid down so that pancreaticolithiasis will be the final picture. The predominant histologic features are extensive acinar necrosis, hemorrhage into the pancreatic tissue, interstitial edema and infiltration with neutrophiles.

Diagnosis

Previous to 1938 when the serum amylase determinations became available, the diagnosis of acute pancreatitis was, at best, uncertain.

Severe epigastric pain struck in a middle age obese individuals. If this pain was accompanied by shock, vomiting, tenderness in the epigastrium, absence of fever, a rapid pulse, and a high white count, the diagnosis became more certain. An attempt would be made to rule out perforated peptic ulcer by flat plate of the abdomen. Acute biliary disease would be considered inasmuch as jaundice would often be present. Possibility of coronary occlusion would be evaluated by electrocardiogram. Mesenteric thrombosis, intestinal obstruction and peritonitis would be considered. After all these considerations, surgery would often be resorted to, inasmuch as one would be anxious to avoid overlooking an acute surgical condition. Morton,[28] Elmon and Schwarz,[16] Godfrey,[19] Puestow et al,[33] and Paxton and Payne [13] attest to the difficulty of making a bedside diagnosis of acute pancreatitis. The correct diagnosis prior to surgery or autopsy is rarely 50 per cent when based on clinical efforts above, in fact, many series have been reported in the past without a single correct diagnosis being made at the bedside.

Obviously what was needed was an accurate laboratory test, simple in execution, that could be completed in less than one hour. The serum lipase was very accurate but required 24 hours for completion. The Somogyi method of serum amylase determination was the answer to that need. Low values and high values could be estimated with accuracy. Backus [6] states that an increase in serum amylase in the blood has great diagnostic significance in acute pancreatitis. Early and frequent determinations are important, particularly in transitory attacks of pancreatitis. A sudden drop in serum amylase content can mean either improvement of a mild attack or such extensive destruction of the pancreas as to preclude any appreciable amylase level. Comfort stresses that in severe acute pancreatitis the maximum amylase level is reached in 12 to 24 hours, and in 3 to 4 days the amylase level has returned to normal. To be of value the test must be performed early. Although it is more difficult to do, the serum lipase is of value, particularly in the late phases of the disease, inasmuch as it remains positive for 6 to 7 days after the onset of an acute attack.

There have been many tests developed for determining the concentration of amylase in the blood. They are all based on the following methods: (1) The iodine test, originally proposed by Wohlgemuth, depends upon the disappearane of the iodine-starch blue color as hydrolysis of the starch is in progress. (2) Viscosimetric method depends upon changes in viscosity of a starch enzyme mixture. (3) The copper reduction method or saccharigenic method, which depends upon the amount of sugar formed from starch by a known amount of enzyme.

The diastatic ferments are active at different stages of starch digestion, hence the results obtained differ with the various methods. Therefore the results depend upon personal experience and available laboratory facilities.

It is worth repeating that the serum amylase determination is the greatest single aid in making a correct diagnosis of acute pancreatitis. A moderate to marked increase in serum amylase is almost always associated with pancreatic disease. The test should be utilized in all upper abdominal diseases when there is any doubt of the correct diagnosis. It should be used more often. Clinicians are becoming more "pancreatitis-minded" and by using the test are recognizing an ever increasing number of the milder forms of acute pancreatitis.

A detailed list of the reagents and the procedure of serum amylase determination as it is used at the Minneapolis Veterans Hospital is given below:

AMYLASE (Somogyi Method)

Sample: 1 ml. serum, fresh and unhemolyzed.

Normal: Amylalytic activity is defined as mg. of reducing sugars expressed in glucose per 100 ml. serum. Normal values are from 40 to 110, averaging about 60.

Reagents: 1. Starch—Place 50 grams pure starch in a liter glass stoppered cylinder, add 500 ml. HCl and shake intermittently during one hour. After sedimentation pour off acid, add about 500 ml. of 0.05 per cent NaCl and shake thoroughly. After sedimentation, pour off salt solution and repeat washing with another 500 ml. portion of salt solution. Finally, spread out the starch on a pad of filter paper and allow it to air dry.

2. Starch solution—Grind 1.5 mg. of the dried starch in a mortar with 5 ml. of distilled water while 90 ml. water are heated to boiling in an Erlenmeyer flask. Transfer the ground starch paste to the boiling water with vigorous agitation, using 5 ml. water to rinse mortar. Boil for 1 min. with stirring. Cover the mouth of the flask with a beaker and heat in a boil-

ing water bath 20 to 30 minutes. Make to 100 ml. when cool. Cover with tuluone and store in refrigerator.

3. Sodium tunstate—6 per cent.

4. Copper sulfate solution—5 per cent.

5. Sodium chloride solution: Dissolve 10 gm. NaCl in water and transfer to 1 liter flask. Add 3 ml. $\frac{N}{10}$ HCl and dilute to mark with water.

Procedure: In each of two 14-16 mm. test tubes, place 5 ml. of starch solution and 2 ml. of NaCl solution. Warm tubes to 37-38° C. in a water bath. Leave tubes in bath. To *Tube I* add 1 ml. serum. Place both tubes in 37.5° C. incubator for exactly 30 minutes. Remove tubes from bath and add at once to *Tube II*, 1 ml. serum, then to both tubes add 1 ml. 5 per cent copper sulfate solution and shake hard; 1 ml. 6 per cent sodium tungstate solution, shake hard. Centrifuge at once. Do usual blood sugar determination on 1 ml. of clear supernatant fluid from each tube. Boil 20 min.

Calculation: Mg. per cent glucose in the incubated serum filtrate minus the mg. per cent glucose in the unincubated serum filtrate equals the units of amylase activity per 100 ml. serum.

Clinical Course

Acute pancreatitis occurs in the middle-age group, with a much higher incidence in men than in women. Biliary disease is present in over half of the cases. The individual is often obese, corpulent, and well fed. The history of alcoholism is too common to be of casual interest. An attack often follows a heavy meal.

The pain is sudden in onset, severe, prolonged, and "tearing" in nature. The pain usually begins in the epigastrium and is often referred to the loins, back, and left subscapular region. Collapse may occur quickly. The pulse is rapid and the blood pressure falls. The skin becomes clammy and a peculiar cyanosis may develop. Patches of slate-blue color may be distributed over the abdomen and limbs and is known as the Gray-Turner sign.

The patient often vomits, and diarrhea and bloody stools may be a terminal occurrence. There is extreme upper abdominal tenderness, but the muscle spasm is not what one would expect with such tenderness.

Unfortunately, acute pancreatitis does not always offer such dramative features. The disease is often not suspected and the abdomen is opened with another diagnosis, only to find the diffuse areas of fat necrosis, bloody fluid, and a diffusely enlarged pancreas.

Within the past decade, particularly since the widespread use of the serum amylase determination, milder forms of pancreatitis are being diagnosed. The type of onset may be similar to that described above, but its duration is brief and the outlook is much better.

All investigators agree that there is a systemic toxemia in addition to the local lesion in acute pancreatitis. At the present time, the mode of action of this toxic agent is unknown. The solution of this problem is essential if we are to reduce the high mortality associated with acute hemorrhagic pancreatitis. It has been suggested that the agent might be the trypsin in pancreatic juice, the products of digestion of pancreatic tissue, or bacterial toxins liberated by bacteria proliferating in the necrotic tissue. Dragstedt [32] and his workers refuted all of these theories by actually repeating the work that had been done to establish these mentioned theories. The nature of this toxic agent is thus unknown.

Prognosis and Treatment

The value of prophylaxis in the treatment of acute pancreatitis is difficult to evaluate. In patients having had mild recurrent attacks it seems fundamental that alcohol and large, heavy meals should be avoided. It appears evident likewise that biliary disease is of etiologic importance. Since gallbladder disease has been more vigorously treated during the past 20 years and since the incidence of acute hemorrhagic pancreatitis is apparently diminishing, it would seem that early treatment of biliary tract disease has been of prophylactic value.

Although the actual incidence of acute hemorrhagic pancreatitis or acute pancreatic necrosis seems to be on the wane as stated above, the over-all incidence of the acute pancreatitis group is certainly increasing. The availability of the serum amylase test is chiefly responsible for the increased diagnosis of mild pancreatitis.

The cause of death in acute pancreatitis is as yet undetermined. It is usually attributed to the previously mentioned profound toxemia. The nature of this toxin is unknown. Evidence is fairly conclusive that it is not due to elements present in the activated pancreatic juice. It has likewise been shown that it is not due to absorption of the products of autolysis or of enzymatic digestion of the dead pancreas. Certainly the existing high mortality can probably be lowered if the nature of this toxin can be determined.

Apart from the above mentioned little understood toxin, the profound shock that accompanies some of these cases probably contributes to the fatal outcome. The mortality is related to the severity of the early clinical manifestation and particularly to the degree and duration of the accompanying shock.

It is understandable that mortality figures depend directly upon the period of the report, i. e., whether or not a relatively large proportion of the cases were of the milder type, so included because of improvement in diagnostic measures. The mortality figures are also improved, due to the recent use of more conservative measures of therapy.

Without listing detailed source of figures one can easily note that the above factors influence mortality figures tremendously. Until the past decade, when acute edematous pancreatitis was recognized as an entity, the cases were all grouped together. They were operated early and the mortality was appalling. It varied from 50 to 90 per cent. At the present time, with relatively more cases of acute edematous pancreatitis being recognized and treated conservatively, it is expected that the mortality figure of the combined group would be less than 30 per cent. It still is true, however, that the mortality of the separated group of acute pancreatic necrosis following early operation, is near 50 per cent. Treated conservatively, acute edematous pancreatitis should have practically a 0 per cent mortality. Thus one would conclude that the overall picture has improved, but in pancreatic necrosis the mortality is too high for complacency.

Factors in the surgical management of an attack of

acute pancreatitis are variable. No didactic course can be followed. The status of the disease, the condition of the patient, statistical teachings, and personal experience must guide one in making a decision. In the extreme crisis, it is likely that the damage has been wrought when the patient is first seen. Nothing can be done to undo the damage. Any operation is hazardous and there is a question as to the good that can be accomplished. Drainage of the lesser sac and cholecystostomy is all that can be attempted in such a critically ill patient.

There is apparently misunderstanding as to what is referred to in the literature as "conservative management" of an attack of acute pancreatitis. This means that one should not operate in a situation as discussed in the previous paragraph. One is practicing "conservative management" however when he operates from two to twelve days following an acute attack if the clinical course shows evidence of failure of the process to resolve or to localize. Thus a "delayed operation" is done if the disease is not self-controlled. Wangensteen [39] practiced conservative management of acute pancreatitis as early as 1932. He was the first, at least in the English literature, to advocate conservatism in this disease.

With the above thoughts in mind one can suggest a general plan of surgical treatment. This outline in general is followed at the Minneapolis Veterans Administration hospital.

1. A patient is never operated upon until the shock, if it exists, is controlled.
2. After preparation and recovery from shock, the patient is operated upon as an emergency if a diagnosis of pancreatitis cannot be made, and there exists a possibility of a "surgical emergency" such as a perforated viscus, etc. If acute edematous pancreatitis alone is found, the abdomen should be closed without any procedure being done. If an acute pancreatic necrosis exists, drainage of the lesser sac and decompression of the biliary tract can be carried out, but a high risk must be assumed. If, however, the serum amylase points to acute pancreatitis and other emergencies can be reasonably ruled out, operation should be deferred.
3. The real trial comes in making the decision as to advisability of an operation from the second to the tenth day. The patient has gone through the crisis of onset and shock period. Fluid may be collected in the lesser sac or pancreas. A large pancreatic abscess or slough may be present. These situations are improved by surgery and the "delayed operation" in this situation is definitely superior to early operation. It is when these conditions are present that Morton [28] advocates surgery—not in the initial period. In addition to the enzymatic and blood sugar level, the clinical course of the patient aids in the decision as to advisability of operation. Rise in pulse rate, white count, sedimentation rate, abdominal pain and distention, and continued hyperbilirubinemia or other indication of common bile duct stone would render operative intervention essential. On the other hand, if in this early delayed period, the signs of inflammation continued to improve, operation should be deferred indefinitely.
4. In those patients who are successfully managed in a conservative manner, interval and elective surgery may be required for chronic cholecystitis and cholelithiasis. At such surgery, the common duct should be routinely explored and decompressed for a prolonged period—at least six months.

Whatever course of surgical management is pursued, general surgical principles are carefully followed regarding treatment of shock and maintenance of proper fluid and electrolytic balance. It is extremely important to suppress pancreatic secretion in any phase of acute pancreatitis. Any oral intake will naturally stimulate pancreatic flow. Therefore one depends upon parenteral fluids and constant intra-gastric suction. The nasal suction acts three-fold: The stomach is decompressed and paralytic ileus, so common in acute pancreatitis is combated. Most important of all, the stomach acids are not allowed to pass over the duodenal mucosa, thus stimulating pancreatic flow by the secretin mechanism. Pharmacologic depression of pancreatic secretion by the use of atropine and ephedrine may be utilized. The antibiotics are of great benefit in handling these processes, either with operative or nonoperative cases.

SUMMARY

1. Generally speaking, there are two forms of acute pancreatitis. The milder type is known as acute interstitial pancreatitis or acute edema of the pancreas. The more severe type is called acute hemorrhagic pancreatitis or acute pancreatic necrosis.

2. As an overall picture, acute pancreatitis is becoming more common. Acute hemorrhagic pancreatitis is less common. Acute edema of the pancreas is more common.

3. The "common channel" mechanism, associated biliary disease, and precipitating dietary and alcoholic debauches are factors commonly related to onset of acute pancreatitis.

4. The release of active trypsin into the acinar tissue is probably the factor of prime importance in the pathogenesis of acute pancreatitis.

5. The serum amylase is the greatest single aid in the diagnosis of acute pancreatitis.

6. Death in acute hemorrhagic pancreatitis is probably caused by a systemic toxemia of unknown origin.

7. Treatment is conservative whenever the individual case can be so treated.

8. The mortality rate should be nil in the cases of acute edema of the pancreas that are not operated upon.

9. The mortality rate in acute pancreatic necrosis is still too high. It is near 50 per cent in the cases operated early and around 30 per cent in the "delayed operations."

* * * *

Below are presented the figures on 13 cases of acute pancreatitis seen at the Minneapolis Veterans Hospital

from January 1, 1947, to March 15, 1948. This covers a period of 14½ months.

Age—Between 24 and 73 years, average 42.

Previous attacks—46 per cent.

History of alcohol or dietary debauch—46 per cent.

Average duration when seen—3.6 days.

Shock on admission—None.

Serum amylase determinations — 70 per cent over 240 units.

Concomitant biliary tract disease—61 per cent.

Jaundice, history or present—40 per cent.

3 Deaths—mortality of 23 per cent.

Cause of Death: (1) Delirium tremor, (2) Pulmonary embolism-senility, (3) Generalized Ca.

Treatment: No surgery—4 cases with 1 death; delayed surgery—7 cases with 1 death; early surgery—2 cases with 1 death; results with conservative management—18 per cent mortality.

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Ankle Protection*

A Study of Methods Used in Athletics

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"THE athlete is as good as his legs" is an axiom of unknown origin to which it is safe to add "and the legs are as good as the ankles," for when they are injured the athlete operates with diminished efficiency if at all. It is important therefore that every precaution be taken to protect the ankle from injury during play. At least that is the attitude of most doctors and trainers connected with athletics. The method of protection is largely a matter of individual choice founded on experience and confidence. This article is written in answer to a self-imposed challenge as to whether or not our training staff at Princeton University was using the best method of protecting ankles.

During the winter and spring, the training staff and the doctors assigned to athletic teams meet every week to mull over current problems, review anatomy and physiology, and check the results of methods. It came to light during these discussions that the rate of injury to the ankle in football had increased from 80 per thousand players before the war, to 127 per thousand since. Why? Was it a normal cycle? Were the players too careless in applying their ankle wraps? Was a greater percentage than normal slipping out without protection? Or was there something to be desired in the method of protection?

The idea of a normal cyclic increase was set aside because the percentage had stayed up too long. A careful check of the records indicated that the unprotected ankles were injured more severely when they were injured but the number involved was no greater than before, whereas the quantity of injuries to wrapped ankles had increased. The figure-of-eight wrap, anchored with tape and emphasizing the upward pull on the outer turn, was the method of choice because it was simple to teach and simple for the individual to apply on himself. This wrapping was carefully inspected in all ankle injuries in which it had been used as a protection to determine whether it had been applied according to instructions. Practically all met specifications. This led to questioning the method and to the decision to investigate how much protection the different known styles give.

A good scheme for conducting this study was suggested by one of the trainers who had read Scott's article on ankles in a Navy Medical Bulletin.[1] In it the author had used the x-ray to demonstrate the effective limitation to inversion of the foot by specially placed pads in Navy shoes. By far the largest proportion of ankle injuries in football happen to the ligaments attaching to the fibula on the anterior and lateral aspects of the malleolus, namely the anterior tibio-fibular and the lateral collateral ligaments. Such injuries occur when the foot and consequently the ankle are forced into a position of hyperinversion with some extension. The aim of protective support is to prevent that inversion or at least hold it within normal limits. This is accomplished by applying the support with the foot at right angles to the leg, slightly everted and emphasizing the upward pull of the external elements of the wrap or tape. The various methods in use include the figure-of-eight wrap, the figure-of-eight wrap with turns around the heel to lock it as described by Quigley[2] of Harvard in the Journal of the American Medical Association, a patented loop-wrap which seeks to lock the heel with a specially prepared loop at the start of the wrap, some modification of the Gibney[3] taping and the figure-of-eight taping. It was decided to test all these methods and although Scott used the pads after injury his method was included because it suggested some interesting possibilities for prevention.

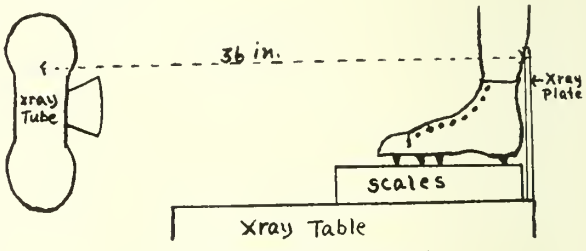


Fig. 1. Illustrating set-up used.

In order to have everything uniform for purposes of comparison, the author was chosen as the guinea pig; the head trainer applied the wraps and tape, and the

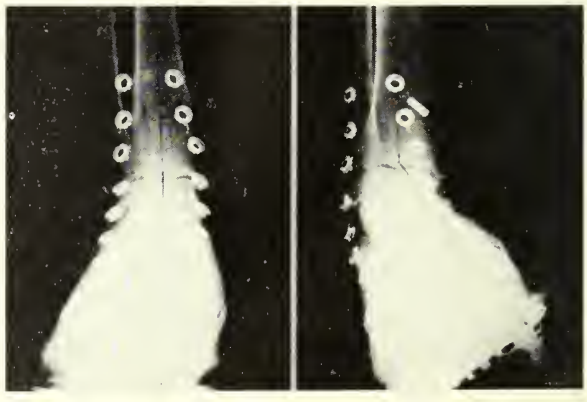


Fig. 2. X-rays of ankle without protection in normal position (left) and fully inverted (right).

*From the American College Health Association.
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x-ray studies were made as nearly the same as humanly possible. Figure 1 indicates how spring scales were set on the x-ray table and the x-ray tube centered on the ankle with the cassette immediately behind and 36 inches from the tube filament. Marks were made on the platform of the scales so that the shoe would be in the same place each time, and the scales registered the amount of weight or pressure applied.

The first and second x-rays (Fig. 2) were made of the ankle without benefit of support other than the sock



Fig. 3. X-ray of ankle showing limitation to inversion by figure-of-eight wrap as illustrated at right.

and shoe which was used in all exposures. The view on the left portrays the ankle in its normal position while the one on the right shows it fully inverted. The inverting was done by merely turning the ankle over and shifting all the weight possible to it so as to stretch the lateral ligaments to the utmost. It was noted that the scales registered 119 pounds (author weighs 145) when the x-ray was taken. In all subsequent studies, the exposures were made with the ankle inverted and the pressure at 119 pounds. Furthermore, the muscles of the leg were relaxed as completely as possible each time to put the full burden on the protection being tested.

The ankle was first protected with the plain figure-of-eight wrap using a strip of two-inch muslin six feet long and anchored with one-inch adhesive (Fig. 3). This was followed by the figure-of-eight wrap with loops



Fig. 4. X-ray of ankle showing limitation to inversion by figure-of-eight wrap with heel loops as illustrated at right.

locking the heel (Fig. 4). The next method to be tested was the patented-loop-wrapper which locks the heel first (Fig. 5) and finishes with a figure-of-eight. A modified Gibney taping applied directly to the skin previously treated with tincture of benzoin to enhance the adhesive



Fig. 5. X-ray of ankle showing limitation to inversion by patented-loop wrapper as illustrated at right.

qualities was investigated next (Fig. 6). This was removed and the skin prepared again for the application of the plain figure-of-eight with 2-inch adhesive (Fig. 7). The final x-ray was made using the shoe with pads glued to the inside over the inner and outer malleoli and the tongue as described by Scott (Fig. 8).



Fig. 6. X-ray of ankle showing limitation to inversion by Gibney taping as illustrated at right.

The resulting x-rays were compared as follows: The sole of the shoe was taken as the plane of the foot and the mid-line of the tibia as the vertical line of the leg. A perpendicular was dropped from the point where this vertical line intersected the articular surface of the tibia at the ankle, to the plane of the foot. The angle between the vertical line of the leg and this perpendicular gives an index of the effectiveness of the various methods of protection assuming that the other factors are the same. To make the comparison more effective, the results were superimposed upon each other to give a composite diagram (Fig. 9). Line 1 represents the ankle in the normal position and line 2 is the ankle inverted to the extreme without support. The latter indicates rather closely the limit of safety for inversion of the particular

ankle used and thereby provides a base for examining the effectiveness of the methods tested as shown by lines 3 through 8, which correspond with figures 3 through 8.



Fig. 7. X-ray of ankle showing limitation to inversion by adhesive figure-of-eight as illustrated at right.

Line 3 represents the plain figure-of-eight wrap to which our faith has been pinned for years. It is self-evident that this support has little value over the unprotected ankle and our fortunes in the past hung on a slender thread. The patented-loop wrapper is some better but does not offer much improvement as indicated by line 5. The greatest limitation to inversion at the ankle is offered by the figure-of-eight, adhesive strap (line 7), but unfortunately it has a decided tendency

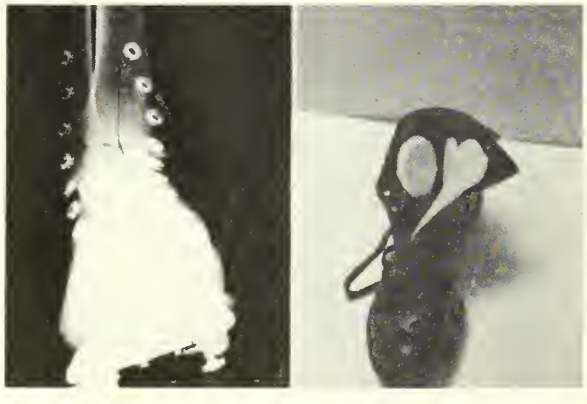


Fig. 8. X-ray of ankle showing limitation to inversion by padded shoe as illustrated at right.

to irritate the tendons of the tibialis anterior and extensor hallucis longus muscles and set up a painful synovitis. This leaves Quigley's method (line 4), the modified Gibney taping (line 6) and the padded shoe (line 8), all of which have a healthy margin of safety to recommend them. The player cannot apply the Gibney upon himself. It is the method used by the staff to protect previously injured ankles and the ankles of a few select-

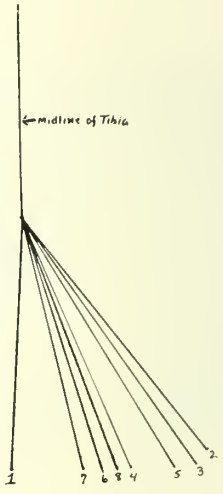


Fig. 9. Composite diagram: (1) standing in football shoe: (2) ankle inverted with no protection: (3) ankle inverted with figure-of-eight wrap: (4) ankle inverted with figure-of-eight wrap and heel lock: (5) ankle inverted with patented loop-wrapper: (6) ankle inverted with modified Gibney tape: (7) ankle inverted with figure-of-eight taping: and (9) ankle inverted with padded shoe.

ed men in games. This policy will be continued as the results have been satisfactory and the test indicates it to be effective. Expense and time consumed make it impractical to adopt the Gibney for general use. The players other than those mentioned, must apply their own protection. The staff is educating them to do so with the figure-of-eight wrap incorporating turns around the heel to lock it. The effect of this new regime will be watched carefully to determine whether an adequate answer has been found to our self-imposed challenge regarding protection to the ankles in athletics. In the meantime the interesting possibility in the padded shoe will be studied.

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Results of Reducing Diets for Overweight University Students*

Ramona L. Todd, Ph.D., M.D., and Dorothy P. Siemers, B.S.
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That obesity is a definite detriment to health is generally accepted by physicians and dietitians. Recommendations for weight reduction are made frequently and the hope is expressed that such suggestions are followed with some degree of success. The Students' Health Service at the University of Minnesota has on its staff a dietitian for instruction and guidance of students for whom special diets are prescribed by staff physicians and return visits for observation are encouraged. Since such an organization affords an excellent opportunity for evaluation of the success of special diets, a study of a group of overweight individuals placed on weight reduction diets was undertaken to determine results of such regimes and to learn more effective methods of guidance of overweight patients.

Selected for study were the individuals who were placed on reduction diets at the Students' Health Service during the school years 1946-47 and 1947-48. The reasons for choosing those two years were: (1) the people had been on diets sufficiently long to allow evaluation of results and (2) most of these students were still available for interviews at the time the study was made. There were 364 (118 men and 246 women) in the group. The ages of the patients were distributed as follows: 18-27 years, 80.5 per cent; 28-37 years, 15.6 per cent; 38 years and over, 3.9 per cent.

Only 14.5 per cent of the group had significant physical defects other than obesity. There were 22 men and 10 women who had hypertension, 7 men and 8 women had allergic manifestations such as hay fever or asthma, two men had duodenal ulcer, two women had iron deficiency anemia, and one man had mitral stenosis and mitral insufficiency.

Almost half (47 per cent) had basal metabolism tests as a part of the examination made before the reducing diet was begun (Table I). Of the 172 who had metabolism tests, 42, or 24.4 per cent, had rates of —11 per cent or below. Comparison with a group of 148 individuals who were not overweight shows that low basal metabolism rates were no more common in the overweight people than in the control group which had 36, or 23.9 per cent, with rates of —11 per cent or below. Neither group contained persons who had had thyroid surgery, or any one who was being treated with thyroid extract at the time of the test; otherwise, no selection was made. A more detailed analysis of the data revealed no correlation between degree of over- or underweight and basal metabolism rate.

The height-weight per cent of each person was computed according to the Medico-Actuarial tables. Only those whose height-weight per cent was greater than 110 were considered sufficiently overweight to be referred for weight reduction. Before institution of the dietary regime, the men in the series tended to be more overweight than the women, as 65 per cent of the women were in the groups of 111 to 130 per cent while 60 per cent of the men were above 130 per cent (Table II).

Of the 364 individuals who consulted the dietitian, 69 per cent of the men and 60 per cent of the women returned for follow-up observations. The following computations and discussion refer to the 243 men and women who were kept under observation during the period of dieting. There were 49, or 20.2 per cent, who continued on a reducing diet until a weight of 110 per cent

*From the Students' Health Service, University of Minnesota.

Table I

BASAL METABOLISM RATES OF OVERWEIGHT PERSONS COMPARED TO A CONTROL GROUP

Basal Metabolic Rate (Per Cent)	Height-Weight Per Cent*											
	110 and Under						111 and Above					
	MEN		WOMEN		TOTAL		MEN		WOMEN		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Cases	53	100.0	98	100.0	151	100.0	45	100.0	127	100.0	172	100.0
+11 and over	16	30.2	10	10.2	26	17.2	11	24.4	15	11.8	26	15.1
—10 to +10	27	50.9	62	63.3	89	58.9	32	71.1	72	56.7	104	60.5
—11 to —20	10	18.9	23	23.4	33	21.9	2	4.4	35	27.6	37	21.5
—21 and below	—	—	3	3.1	3	2.0	—	—	5	3.9	5	2.9
Total —11 and below	10	18.9	26	26.5	36	23.9	2	4.4	40	31.5	42	24.4

*According to Medico-Actuarial Tables.

TABLE II

DEGREE OF OVERWEIGHT AT BEGINNING OF REDUCTION DIET

Height-Weight Per Cent Group	MEN		WOMEN	
	No.	Per Cent	No.	Per Cent
111—120	14	12	86	35
121—130	34	28	74	30
131—140	29	25	42	17
141—150	22	19	25	10
151 and over	19	16	19	8

or less was reached. In this respect, the women did considerably better than the men as 27.6 per cent of the women and 8.5 per cent of the men were successful. As noted above, a larger number of the women were only mildly overweight. The men showed a greater average weight loss in every height-weight per cent group except the 111-120 per cent group (Table III). The

TABLE III

AVERAGE WEIGHT LOSS ACCORDING TO HEIGHT-WEIGHT PER CENT AT BEGINNING OF REDUCTION DIET

Height-Weight Per Cent Group	Sex	No.	Ave. Total Pounds Lost	Pct. Successful
111—120	Men	10	6.8	50
	Women	52	7.2	52
121—130	Men	22	12.8	9
	Women	45	9.2	20
131—140	Men	20	14.3	0
	Women	25	10.2	0
141—150	Men	15	16.3	0
	Women	15	13.3	7
151 and over	Men	15	21.3	0
	Women	12	11.2	0

only persons who were successful in reducing to 110 per cent or below were in the 111-120 and 121-130 per cent groups with the exception of 7 per cent of the women in the 141 to 150 per cent group who followed the diets until their goals were reached. Further analysis of the data revealed no correlation between age of the patient and weight loss.

A daily allowance of 800, 1000, 1200, or 1500 calories was prescribed. The 1000 calorie diet was used most frequently for women, and 1200 calorie diet most frequently for men (Table IV). In general, greater losses were recorded for those in the 1200 and in the 1500 calorie groups. The more restricted allowances of 800 and 1000 calories apparently were not followed as well

TABLE IV

AVERAGE TOTAL WEIGHT LOSS ACCORDING TO PRESCRIBED DAILY CALORIC INTAKE

Calories	Sex	Number on Diet	Ave. Total Pounds Lost	Per Cent Successful
800	Men	2	14.2	0
	Women	49	9.1	26.5
1000	Men	34	11.1	8.8
	Women	88	9.6	28.4
1200	Men	40	15.8	2.2
	Women	15	11.1	33.3
1500	Men	17	15.0	11.8
	Women	3	21.7	33.3

as were the more lenient diets. A perusal of Table IV indicates that a 1500 calorie diet was the most acceptable of the four groups; however, the small numbers of men on 800 calories and women on 1500 calories are not sufficient for accurate comparison with the other groups. Further observations would be necessary before any conclusions could be drawn regarding calorie allowances and success of diets.

There were 23 women for whom Dexedrine sulfate was prescribed to decrease the desire for food. These women lost an average of 7.2 pounds during the first month of their diets and the total average loss was 10.1 pounds. The women for whom no medication was prescribed lost an average of 5.5 pounds during the first month and their total average loss was 7.5 pounds. These results would indicate that Dexedrine sulfate was helpful but the group of 23 is too small to permit accurate generalization regarding the effectiveness of this drug.

SUMMARY AND CONCLUSIONS

1. Of 172 overweight persons, 42, or 24.4 per cent, had basal metabolism rates of —11 per cent or below. There were 36, or 23.8 per cent, of 148 individuals who were not overweight who had rates of —11 or below. In this series, low metabolism rates are not more common in overweight people.

2. There were 49, or 20.2 per cent, of 243 persons placed on weight reduction diets who were successful in reaching a weight of 110 per cent or below. Most of these were only mildly or moderately overweight.

3. A small group of 23 women for whom Dexedrine sulfate was prescribed showed a greater average weight loss for the first month of their diets as well as a greater average total loss than women without medication.

A ten-year project at Yale University headed by Dr. Arnold Gesell reveals for the first time the detailed development of vision in infants and children and produced findings that establish a new approach to the problems of child vision. These findings show that the child is never a miniature adult even in his visual equipment, and that it should not be necessary to wait until belated adolescent and adult years to determine the efficiency of his visual functions.

Postpartum Optic Neuritis Due to Multiple Sclerosis*

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Multiple sclerosis is a disease of unknown etiology characterized by scattered areas of sclerotic plaques in the brain, spinal cord, and optic nerves. The sclerotic changes consist of demyelinization and glial tissue formation in both the white and gray matter. The disease occurs in all races and, according to Marburg,[1] is found more often in the female than in the male.

Because of the hit-and-miss distribution of the plaques the symptoms are quite varied. Most commonly the individual first notices transient paresthesias of the extremities or visual impairment due to inflammatory changes in the optic nerve. The onset is generally abrupt and may follow an acute infectious disease, acute fatigue, or, as will be shown further, a normal pregnancy. The triad of Charcot-nystagmus, intention tremor, and scanning speech is not found in early cases, but is a manifestation of late involvement of the disease.[2]

The ocular signs are very important in the diagnosis of multiple sclerosis. Nystagmus, muscle paresis, and optic neuritis are frequently encountered in the early stages of the disease.

In this report, the term optic neuritis will be used to designate sclerotic involvement of the optic nerve. Strictly speaking, an optic neuritis signifies involvement of the optic nerve anterior to the point of exit of the central retinal vein and is manifested by papilledema whereas retrobulbar neuritis is caused by the same lesion posterior to the exit of the central retinal vein and is differentiated by the absence of papilledema.

According to McIntyre [3] optic neuritis is found in 50 per cent of all cases of multiple sclerosis at some stage of the disease. Conversely Benedict and Koch [4] in their series found that 50 per cent of the diagnosed cases of optic neuritis are suffering from multiple sclerosis.

Usually the first symptom of optic neuritis is mild pain in the eye aggravated by movement of the eye. Moving the eye causes a stretching of the optic nerve which in the inflamed state produces pain. This is followed shortly by a rather abrupt partial loss of vision which reaches a maximum intensity in twenty-four to thirty-six hours. Most commonly only one optic nerve is affected at a time, although bilateral cases do occur. The visual impairment is generally not complete and typically is manifested by a dense central scotoma with preservation of good peripheral vision, so that the individual while unable to read or recognize small objects is not hindered in getting about.

The loss of vision is most intense during the first two or three weeks and then gradually improves over the next two or three weeks. In rare cases there is a permanent loss of vision. Permanent visual loss is most apt to occur in those cases with marked edema of the optic nerve due to spread of the edema to the macular area with consequent retinal pigment changes remaining after disappearance of the edema. Examination of the fundi after visual recovery generally demonstrates a pale optic disk due to partial atrophy, although a few cases will not show any change in color of the optic disk. It might be mentioned here that the degree of pallor of the optic nerve head is no indication of the degree of visual loss.

Recurrence of optic neuritis is the rule and may involve the previously unaffected eye or the same eye. With each succeeding attack the prognosis for complete visual recovery becomes progressively less.

Treatment consists of rest, mild sedation, large doses of vitamin B complex and multiple intravenous injections of triple typhoid vaccine. In recent years histamine has often been used instead of typhoid vaccine. However, there is little difference in the clinical response.

As was mentioned previously, multiple sclerosis is occasionally first manifested after a normal pregnancy. Pregnancy, and some of the other predisposing factors, merely activate what was previously a latent or subclinical form of multiple sclerosis.

In these women the first symptom of the disease often is a sudden onset of blurred vision occurring several months after delivery. The course of the disease and its response to treatment is no different in these cases than in those not associated with pregnancy.

During the past two years we have followed five patients who developed signs and symptoms of multiple sclerosis after pregnancy. The following two brief case reports illustrate the occurrence of symptoms of multiple sclerosis following an uncomplicated pregnancy:

Case 1. Mrs. C. H., age 22. This woman noticed a sudden onset of blurred vision of the left eye four months following delivery of a normal child. The vision of the left eye was reduced to hand movements peripherally. Visual fields for this eye showed a lower nasal quadrant contraction with a paracentral scotoma. Ophthalmoscopic examination revealed a low-grade edema of the left optic disk. Examination of the right eye was normal. Following treatment with intravenous triple typhoid vaccine and vitamin B complex the vision became normal. Three months later the optic nerve of this eye was somewhat pale in color due to partial optic atrophy. The visual field was normal at this time.

Case 2. Mrs. R. K., age 30. This patient noticed an abrupt onset of visual diminution of the left eye ten weeks after delivery of a normal baby. Her past history showed that nine

*Presented at the meeting of the North Dakota Society of Obstetrics and Gynecology on October 22, 1949.

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years before she had partial temporary blindness occurring suddenly in the right eye which lasted for three weeks. This first attack had followed pregnancy by six weeks. Prior to the second attack of visual impairment she had transient attacks of numbness of the lower extremities lasting two to three weeks. Ocular examination showed the vision of the left eye limited to hand movements. Visual fields demonstrated a marked contraction of the temporal portion which extended over the fixation area. The fields for the right eye were normal. Ophthalmoscopic examination showed a marked pallor of the right optic disk due to partial atrophy as a result of the attack of blindness following the first pregnancy. The left optic disk at this time was normal. After treatment with triple typhoid vaccine intravenously and oral vitamin B complex her vision improved so that at the end of three months it was again normal. The visual fields at this time were normal, but now both optic disks were pale.

Two months after treatment was discontinued this patient again became pregnant. She delivered a normal baby without complications. Immediately following delivery a sterilization procedure was performed. Three months after delivery this patient again developed an optic neuritis of the left eye with markedly reduced vision. Improvement in vision was complete after four weeks treatment with intramuscular histamine and oral vitamin B complex.

These two cases show that pregnancy can initiate an attack of optic neuritis in women who previously had no stigma of multiple sclerosis or who had been free of symptoms for a number of years prior to pregnancy and delivery.

The question arises as to whether a woman who has proven multiple sclerosis should become pregnant. Also whether interruption of pregnancy is indicated in women suffering from multiple sclerosis. One of our cases, not cited here because of inadequate follow-up, developed, within three months of delivery, bilateral optic neuritis resulting in partial permanent blindness, loss of bowel and bladder control, and inability to use the lower extremities so that she has been confined to bed since that time.

On the other hand Birner [5] and also Kushner [6] each reported a case of multiple sclerosis that improved neurologically following pregnancy.

Fleck [7] divides the cases of women in the child-bearing age who have multiple sclerosis into two groups. In the group where there is no progression of the symptoms of multiple sclerosis and little or no disturbance of function or psychic disturbance he does not advocate either sterilization or interruption of pregnancy. In the second group where there is gross disturbance of physical and psychic capacity he believes pregnancy should be interrupted and sterilization done.

According to Hunter and Darner [8] women who have an acute exacerbation of multiple sclerosis in the postpartum period should be sterilized following their third pregnancy even though they are relatively free from symptoms of the disease between pregnancies.

Although the decision to allow a pregnancy to go on to term or to prevent the occurrence of pregnancy is not a decision the ophthalmologist must make we believe one should be governed by the principles laid down by Fleck. Each case must be considered individually and the decision reached with the full cooperation and understanding of the patient.

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WISCONSIN BUILDS HEART RESEARCH INSTITUTE

Through a grant of $291,000 from the federal government, the University of Wisconsin next spring will begin construction of a Heart Research institute which will consolidate all phases of cardio-vascular research.

Plans call for a fifth and sixth floor addition to McArdle Memorial laboratory to house this important research project. The move will facilitate coordination between heart research in physiology, pharmacology, anesthesiology, medicine, surgery, and anatomy.

The quarters, expected to be ready next fall, will be new, but the research program is not. Wisconsin scientists have been heavy contributors to heart research since the first course in medicine was offered at the University back in 1904.

A New Vaginal Speculum*

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The word speculum is derived from the Latin word *specio,* or, translated, to see. Also, speculum refers to *mirror,* and in many instances, such a combination has been used, namely, both as speculum and a mirror.

To trace the appearance of the speculum, we must embody a large part of the history of gynecology itself. The history of the speculum demonstrates that gynecology did not advance in a straight line, but rather in a circle, for many discoveries, or which were thought as such, were only rediscoveries which had in some manner been forgotten.

Gynecology can only be traced with clearness to the Greeks, but there is evidence that under the Ptolomies of Egypt, the practice of gynecology was regulated by a book on the art, as indicated in the writings of Homer and Herodotus. But when the Saracens destroyed the Alexandrian Library, all these records were lost. Since the Greeks and the Egyptians varied much in characteristics, it is perhaps safe to say that little of the Egyptian learning was found in Grecian records. The oldest records of gynecology were those of Hippocrates, written about 450 B.C. Although some of his ideas were very crude, others have not been bettered to this day. Because the Romans derived their knowledge mainly from the Greeks, their observations probably were not original. Celsus and Galen were the main writers of this time, and there is enough of their work extant to show that as early as the first century of the Christian era, the speculum, rediscovered by Recamier in 1816, was not unknown, and allusions were made to digital examinations for diagnostic use. In the excavations of the ruins of Pompeii and Herculaneum, 79 A.D., after having been buried for nearly 1800 years, there were found two speculæ which were probably in use at the time of the eruption.

After an interim of almost 500 years, we find Celsus and Aetius working in the Library of Alexandria. From their writings, we know of the medicine of Egypt a millennium and a half ago. The tetrabiblus of Aetius is very good on the status of gynecology, and treats of the ovaries, uterus and instruments for the ocular examination of the uterus, and mentions sounds. Paul of Agina wrote following Aetius, but he is referred to as a plagiarist. During the next thousand years the Saracens sought to make amends for the destruction of the Alexandrian Library, but little progress was made because of the tenets of the Moslem religion, which forbade visual and digital examinations of the female genitalia. In the Arabian writings of Albucasis in the 14th century, we find an occasional allusion to the speculum. Although Albucasis was a Jew, his practice did not differ from that prescribed by the Moslems, and, if so, perhaps he never used a speculum. It is apparent from the subsequent writings of Paré and Scultetus that the speculum was not forgotten, but nevertheless, a thousand years before its rediscovery by Recamier, if it is a rediscovery, the speculum was a lost instrument and gynecology a lost art.

The first reference to a speculum in American gynecology is around 1717. In England, gynecology progressed under Hunter, but in America, the Revolutionary War diverted attention and cooperation for the seven years, and perhaps ten years, after. The Americans were soon stimulated, however, mainly through Recamier's revival of the speculum, and their works were not much inferior to those of Hunter. The first American of note was Ephraim McDowell, born in 1771, who did the first ovariotomy prior to the first use of anesthesia in 1809. McDowell's work was transferred to England because he previously studied under John Bell, and to him he sent a paper on the ovariotomy. J. Marion Sims, rightfully called the father of American gynecology, was born in 1813, and his fame rests on the first successful attempt to cure vesicovaginal fistula, through which feat came the discovery of the vaginal speculum.

Before 1852, the stumbling block of gynecology was the relief of vesicovaginal fistula. Surgeons, from Paré on, had attempted operations on fistulæ, but failed. Lombolle wrote on fistula cases, but could report only failures. The first successful operation reported in 1787, was by Meltaner of Virginia, but the first real work on that condition was that of Sims. Peculiarly, before 1805, Sims practiced medicine, but abhorred treatment of women's diseases, usually referring those types of cases to someone else. Once called upon to treat a Negro servant with fistula, he told the woman that he would send her home, and that he could do nothing for her. Getting into his buggy to make his morning visits to his patients, he was also called to see a woman who had been thrown from a horse and was suffering with terrific back and bearing-down pains and tenesmus of the bladder and rectum. He found the uterus retroverted and took it for granted that it was the result of the fall.

*In 1922, as a Fellow in the Obstetrical and Gynecological Department at the University of Minnesota, under the late Dr. J. C. Litzenberg, I was requested to write a history of the vaginal speculum. Therefore, it is to this great national figure and a most loyal friend of mine that I dedicate this presentation.

Credit is also given for the excellent illustrations to Miss Jean Hirsch of the University of Minnesota Medical Art Shop; to Miss Virginia Moore of the same Art Shop.

Remembering the lectures of Dr. Pruloeau, he put her in the genu-pectoral position, and first used one finger, but, being only able to reach the uterus, he used two fingers and turned the palm up and down. Suddenly he felt no uterus, and the woman said she was relieved. She fell over from exhaustion, and in so doing there was a noise as of air escaping from the bowel, but which Sims knew was the air that had entered the vagina as a result of his manipulations, and which had caused the uterus to be righted. Sims was reminded of his fistula cases, and thought that if he could distend the vagina he could get a better view of the parts than before. Procuring a large pewter spoon, he hurried back and saw the Negro woman, who had not yet left the hospital. Placing her in the genu-pectoral position, and placing a student on each side, he instructed them to lay hold of the nates and spread them forcibly apart, which caused air to rush in, distending the vagina. By putting in the spoon, which he bent, and drawing back the perineum, the fistulous opening and the sides were evident, the cervix was visible, and the vaginal walls were seen closing around it on all sides. This at once gave him the idea that he could pare the edges of the fistula and bring them together with sutures. He collected many of the fistula cases, and operated on them, although anesthesia was not yet used. He encountered many difficulties—first the drainage, then the tying of the sutures high up. He finally introduced successfully the use of a silver suture.

His speculum was a single type and is still known today as the Sims speculum. In the course of time, various men devised bi-valve or duck bill instruments, cylindrical instruments and other variations, always going back to the same definition of the word, *to see*. Again, with the progress of gynecology, other procedures were devised, such as the dilatation of the cervix and the curett by which the endometrium can be scraped and microscopically examined. Because of the need of getting tissues from the cervix, which at times is difficult because of the mixing of cervical and endometrial tissue, we have come to utilize various devices for the so-called screening processes. Up to the present time, any speculum, single or bi-valved, offers little help in retrieving uterine or cervical scrapings from the vaginal vault. We must remember that with the woman on her back, and the legs in stirrups, the vaginal canal runs backwards and downwards. The speculum has to depress the perineum down in order to visualize the cervix, and, with the type of speculae we have today, no means are afforded to retrieve the tissues obtained by currettage, or otherwise. Usually, resort is made to the use of an ordinary teaspoon or tablespoon, or the sponging out with gauze and a long uterine dressing forcep. It was, therefore, felt that without making too radical a departure from the instruments in use, a speculum could be devised which would facilitate the retrieving of tissues and screening.

Two figures of the newly devised speculum are presented. Figure *a.* shows a view of the speculum from the side and a trifle from the side and above. From this figure it can be noted that the vaginal blade is deeper than most of the old speculæ, and that the end of the inserting tip comes up, the purpose of which is to collect tissues obtained. The new feature incorporated, of course, is the side delivery spout, which facilitates the retrieving of the tissue. It can also be seen that the handle is set farther forward, thereby bringing the end of the speculum farther towards the operator and away from the perineum.

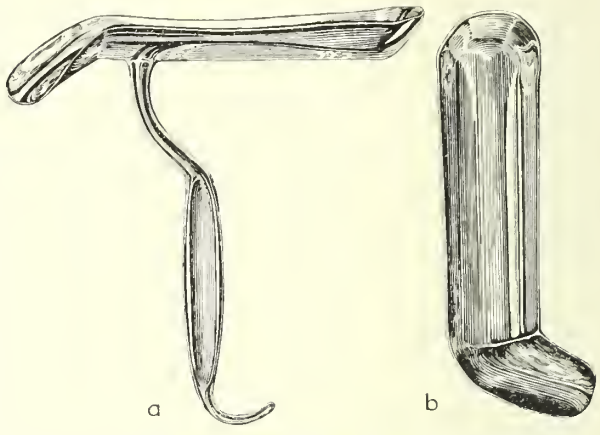


Fig. *a.* Essentially a lateral view with a slight superior aspect of the vaginal blade, showing the deeper blade and the speculum extending back of the handle with the spout going backward and downward.

Fig. *b.* A superior view of the vaginal blade showing the spout extending laterally and also downward.

Figure *b.* represents a superior view and demonstrates the blade and the side spout. In the use of the speculum, it is suggested that the patient's buttocks be brought low down and over the edge of the table so that the whole speculum can be tilted downward, facilitating the flow of the tissue through the side spout and into a suitable container. The flow can be facilitated by use of a small gauze pledget which can whisp the tissues forward. The majority of the previous speculæ had no posterior spouts and most of them had grooves in the handles, so that the wanted tissues were lost or spilled over the hands of the operator. A model was first molded crudely in clay, which served as a working guide by Harold Bjostad of the Brown & Day firm of St. Paul, Minnesota, under whose hands the new creation was consummated. The first original new speculum which is illustrated will perhaps need few minor changes. A manufacturer can easily produce it in various sizes.

No claim is made for an extraordinary innovation, but as shown by the history of the speculum, the need of an instrument presented itself. There is no wish for carving of a niche in the hall of history but a hope to submit a useful new type of instrument.

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Interstitial Pregnancy*

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The implantation and growth of the fertilized ovum in the interstitial portion of the fallopian tube constitutes an interstitial pregnancy. Development takes place within the uterine wall outside the uterine cavity because of the thinness of the tube in this portion. Rupture takes place relatively late due to the muscle character in this area. Early in the gestation, the signs and symptoms may be those of a normal pregnancy, and the differential diagnosis between this condition and a true cornual pregnancy is often difficult.

Interstitial pregnancy is rare, yet more common than primary ovarian or primary abdominal pregnancies.[1] Incidence figures vary from 3.3 to 13 per thousand cases of ectopic pregnancy.[2] Wynne reported an incidence of 1.16 per cent in his series of which 23 were unruptured at time of surgery.[3,4] One hundred ninety-nine cases were reported in the literature as of July, 1943, per Grusetz and Polayes who reported the fourth case going to term unruptured.[5]

Report of Case

Mrs. D. M. A., a 21-year-old German war bride, was first seen December 12, 1948, with complaints of onset of dysmenorrhea two months previously, moderately severe and lasting the first two days of her period. Past history was non-contributory. Physical examination including pelvis was normal with the exception of a slightly enlarged uterus and right ovary. The impression was acquired dysmenorrhea and possible cyesis. She was next seen on the 22nd of June, 1949, with the history of normal menses until April at which time she was two weeks late. Following this period she continued to bleed every 8 to 10 days for a period of four or five days using 8 to 10 pads for the interval of bleeding. This was accompanied by nausea and non-localizable dull abdominal pain. Physical examination revealed prominent areolar tubercles and a symmetrical soft abdominal mass extending 13 cm. above the pubis. The patient was pallorous, not in shock, the blood pressure 92/60. Pelvic examination confirmed the pelvic origin of mass described above, apparently uterus, soft and slightly tender. The cervix was enlarged, soft, patulous with cloudy, bloody discharge.

Anterior and oblique x-rays of the lower abdomen showed an oval mass extending to a little above the sacro-promontory; no fetal parts were seen.

Laboratory examinations: Urine analysis within normal limits; hemoglobin 59 per cent (17 gram Sahli); erythrocytes 3,020,000; leucocytes 8,000; sedimentation rate (Westergren) 41; blood group A, and the Rh factor negative. The blood Wassermann was negative.

The patient received a transfusion of appropriate blood in preparation for surgery.

The uterus was sounded to 13.7 cm., the cavity seemed symmetrical and was curreted of many old blood clots and a moderate amount of necrotic appearing tissue. The uterus was packed with iodoform gauze. At laparotomy, the uterus was symmetrically enlarged to a point just below the umbilicus. The distal two thirds of the left fallopian tube showed chronic inflammatory changes, the left ovary contained a corpus luteum. The right tube appeared grossly normal as did the right ovary. Just below and anterior to the right cornua there was a superficial mass, spongy to the touch, with prominent, tortuous serosal vessels coursing over the surface. The mass was incised followed by the immediate expression of a male fetus 8.8 cm. crown-rump length within an amniotic sac and attached to a placenta. No communication to the uterine cavity could be demonstrated although a careful search was made. The incision was closed with interrupted catgut sutures. On the third postoperative day the patient passed a decidual cast per vagina. The postoperative course was uneventful and subsequent check revealed a well involuted uterus.

The pathologist's report of the curettings was old blood clots with necrotic decidua. There was a male fetus and placental tissue.

Conclusions

1. Interstitial pregnancy is a rare type of ectopic gestation.

2. Rupture occurs relatively late.

3. A case report of an unruptured interstitial pregnancy is presented.

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The Use of Iodine in a Solusalve Base as an Antiseptic

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THE use of organomercurials as antiseptics, as well as their implied potency has been the subject of many papers. The Council on Pharmacy and Chemistry of the American Medical Association in its most recent comment [1] felt that the proof of their effectiveness did not fully satisfy the standards of scientific criticism. This dissatisfaction with the commonly used antiseptics caused a renewed interest in iodine, an antiseptic which has been used since early in the 19th century.

In 1839 the French surgeon Boinet used iodine in the treatment of an inguinal abscess. He injected 80 cc. of 1:15 dilution of iodine into the drainage tract of the abscess. The unnecessarily strong concentration caused intense pain, but 12 days later the abscess had healed and 20 years later the patient was reported in good health. Koch, in 1881, discovered that bichloride of mercury in dilute solution had a bactericidal effect. Eight years later Geppert challenged his findings, insisting that Koch's technique did not account for the bacteriostatic action of mercury. It is now apparent that any critical evaluation of an antiseptic must record both the initial potency as well as the secondary bacteriostatic effects occasioned by the adherency of the compound to the bacteria cell.

Bacterial Power

Morton, North and Engley [2] tested the bactericidal powers of the following organomercurials: (1) the disodium salt of 2,7-dibrom-4-hydroxymercurifluorescein, merbromin, N.F., Mercurochrome, (2) sodium ethylmercurithiosalicylate, Merthiolate, (3) the anhydride of 4-nitro-3 hydroxymercuri-orthocreso, Metaphen. They seeded hemolytic streptococci (Streptococcus pyogenes-strain C203M) in a medium consisting of beef broth to which 10 per cent horse blood was added. Mercurochrome, Metaphen and Merthiolate undiluted and in 1:2 dilution were added to the culture. After intervals of 5, 10 and 15 minutes exposure to the antiseptic the organisms were subcultured in the thioglycolate medium (Linden's Formula).[3] The fact that both vegetative cells and spores are still infectious while in a state of bacteriostasis is sufficient reason for taking precautions to eliminate the bacteriostatic effect of mercury while testing mercurial compounds in vitro for germicidal activity.

In the light of their investigation of the organomercurial compounds the authors of the above-cited report [2] made the following statements as to the antiseptic effectiveness of Merthiolate, Mercurochrome and Metaphen:

Merthiolate: "Merthiolate 1:1,000, aqueous, when allowed to act on a culture of hemolytic streptococci for ten minutes was not a disinfectant because mice injected with such mixtures invariably died. In all 16 out of 17 mice injected with such mixtures died."

Mercurochrome and Metaphen: "Mercurochrome 2 per cent and Metaphen 1:1,500 failed to kill streptococci within an exposure period of even 15 minutes when the culture germicide mixtures were subcultured into the thioglycolate medium; and they failed to protect all the mice from fatal infections. When the cultures of the streptococci were treated with the marketed concentrations of these compounds diluted 1:2 and then injected into mice nearly all the mice died."

Comparable tests were made on iodine in a solusalve base* by the Chicago Board of Health.[4] The procedure was much the same as that followed by Morton et al.[2] The germicidal agent was one gram of iodine in solusalve diluted in 10 ml. of sterile saline solution. One milliliter of this solution was added to the broth culture in the test tube. The tube was shaken vigorously and at the time intervals, 1, 2½, 5 and 10 minutes, 1.1 mls. of the culture-germicide mixture was removed and placed in a culture medium as follows:

(a) 0.5 ml. in a sterile Petri dish to which 10 mls. of melted blood agar were added and mixed thoroughly.
(b) 0.5 ml. in 5 ml. of thioglycolate medium.
(c) 0.1 ml. in veal infusion broth.

These cultures were incubated at 37° for 48 hours.

Cultures which showed no growth after 48 hours were subcultured and those subcultures were incubated for seven days at 37° C. Cultures showing growth were examined microscopically and also plated on red blood agar.

At the ten-minute interval two mice were injected with 1 ml. and ½ ml. of the culture Vodine solution respectively. Mice were injected with 1 ml. and .25 ml. of the hemolytic streptococcic culture as controls for the pathogenicity of the organism.

*Vodine—iodine 2 per cent, sodium iodide 2.4 per cent, Solusalve (Polyethylene glycol ointment base).

The results of the test were as follows:

CONTROLS

Mice	Result	Heart Blood Culture
1.00 ml. of streptococci culture	Died in 9½ hours	Positive
.25 ml. of streptococci culture	Died in 96 hours	Negative
Iodine solution		
1.00 ml.	Died in 29 hours	Negative
.25 ml.	Died in 29 hours	Negative
Iodine solution and streptococci		
1.00 ml.	Died in 29 hours	Negative
.25 ml.	Died in 120 hours	Negative

BACTERIOSTATIC TEST

Time in Minutes	Culture Medium	Results	Subculture Results
1	Blood agar plates	No growth	No growth
2½	Blood agar plates	No growth	No growth
5	Blood agar plates	No growth	No growth
10	Blood agar plates	No growth	No growth
15	Blood agar plates	No growth	No growth

Hemolytic streptococci failed to grow after one minute exposure to the iodine solution diluted to 1 to 10 in sterile saline solution.

BACTERICIDAL TEST

Time in Minutes	Culture Medium	Results	Subculture Results
1	Veal infusion broth	No growth	No growth
2½	Veal infusion broth	No growth	No growth
5	Veal infusion broth	No growth	No growth
10	Veal infusion broth	No growth	No growth
15	Veal infusion broth	No growth	No growth
1	Fluid thioglycolate	No growth	No growth
2½	Fluid thioglycolate	No growth	No growth
5	Fluid thioglycolate	No growth	No growth
10	Fluid thioglycolate	No growth	No growth
15	Fluid thioglycolate	No growth	No growth

Hemolytic streptococci failed to grow after one minute exposure to a sterile saline solution containing one gram of the iodine preparation in 10 mls. of solution.

One milliliter of this solution, when injected intraperitoneally into a mouse weighing 18 grams, proved fatal in one hour. One milliliter of this solution, with hemolytic streptococci added, when injected intraperitoneally into a mouse weighing 18 grams proved fatal in 29 hours.

In these tests no hemolytic streptococci were found in the heart's blood of the mice injected with the germicide-culture mixture. The pathogenicity of the organism for mice was proved by the fact that the animals injected with hemolytic streptococci culture alone died in 9½ hours and the organisms were isolated from the heart's blood. Mice injected with the germicide-culture died after 29 hours. This indicated that the cause of death was other than the streptococci infection. Tests on the fungicidal efficiency of the iodine solution for M. albicans and T. interdigitale revealed that neither fungus grew after one minute exposure.

Relative Toxicity of Iodine and Mercurials

The antibacterial action of mercurial compounds is much reduced in the presence of blood serum and Waller [5] found that a final concentration of 1:5,000 Merthiolate destroyed the anti-Rh agglutinins in human serum.

In 1935 Salle and Lazarus [6] determined the highest bacteria killing dilutions of a number of antiseptics including Mercurochrome, Metaphen, Merthiolate and iodine. They also ascertained the dilutions of these substances which permitted no tissue growth. By dividing the latter by the former they obtained a toxicity index. It is obvious that if the dilution sufficient to kill the tissues were higher than that necessary to kill bacteria, the toxicity index would be more than 1.0 and the "germicide" would be seriously deficient. The results of the tests were as follows:

Germicide	Toxicity Index
Iodine	0.09
Hexylresorcinol	3.0
Metaphen	12.7
Phenol	12.9
Merthiolate	35.3
Mercurochrome	262.0

The above work indicates that Metaphen, Merthiolate and Mercurochrome were 12, 35, and 262 times more toxic for embryonic tissue cells than for Staphylococcus aureus. Nye [7] and Welch [8] also found the same three mercurials more toxic for leucocytes than for bacteria cells.

The objections to the U.S.P. tincture is that the solvent is lost by evaporation and the iodine by volatilization. Beal et al [9] reported that a survey of 13 household samples of strong iodine tincture had shown a tendency to be somewhat stronger than official specifications. Iodine in the solusalve base was compared with U.S.P. XIII hydrophilic iodine ointment, as to stability and penetration.

COMPARISON OF VODINE AND U.S.P. XIII HYDROPHILIC OINTMENT*

	Temperature	Percentage Iodine At Start	24 Hrs.	96 Hrs.
Vodine	23.5°C.	1.84	1.86	1.83
	37.5°C.	1.84	1.86	1.81
U.S.P. XIII Hydrophilic ointment 2.0% iodine; 2.4% sodium iodide	23.5°C	2.02	1.61	1.33
	37.5°C	2.02	1.42	1.06

The iodine in Vodine remained practically unchanged while that in the U.S.P. hydrophilic ointment was volatilized to a marked extent. After 96 hours at 23.5° C. (room temperature), about 33 per cent of the iodine in the hydrophilic ointment was lost, and at 37.5° C. the loss was approximately 47.0 per cent.[10]

The difference in penetration of Vodine and U.S.P. iodine ointment also was compared. A 4 per cent agar solution with starch dissolved as an indicator was poured

*U.S.P. XIII hydrophilic ointment—iodine 2.0%, sodium iodide 2.4%; ointment base, (wood fat 5.0%, yellow wax 5.0%, petrolatum 90.0%).

into test tubes and allowed to set. The ointment was put into the tubes in the space above the agar. The extent of the diffusion of the iodine into the agar was indicated by the blue color the iodine formed with the starch. The results are given in the table below:

PENETRATION TESTS
VODINE AND U.S.P. IODINE OINTMENT

	Depth of Penetration	
		U.S.P. Iodine
Time after start	Vodine	Ointment
1 day	15 mm.	6 mm.
3 days	25 mm.	8 mm.
6 days	32 mm.	8 mm.
9 days	36 mm.	9 mm.
18 days	47 mm.	9 mm.

The U.S.P. iodine ointment remained practically stationary whereas the Vodine preparation penetrated to a depth of 47 mm. in 18 days.[11]

Vodine was used on 200 patients treated in the admitting room of a Chicago hospital. All age groups were represented, the oldest being 77 years and the youngest 26 months. The medication was used on all parts of the body for lacerations, abrasions, stab wounds, dermatophytoses, burns and dog bites. Pain did not accompany the application, nor was any discomfort reported even when the affected area was relatively large.

In some cases the skin became slightly softened but this appeared to be of no clinical importance. There was no crusting and the preparation was easily removed. None of the patients complained of any soreness or tenderness of the skin even after repeated applications. Bandaging and body temperature in no way affected the consistency of the preparation.

In all cases infection was prevented and healing was normal and uneventful. In wounds which had been sutured, integrity of the wound or sutures was not interfered with. No allergic reactions were observed, even with repeated applications.

SUMMARY

1. Iodine solutions have been found to be superior to organomercurial compounds as antiseptics.

2. The stability and penetrative ability of Vodine was found to be greater than U.S.P. XIII hydrophilic iodine ointment.

3. Clinically, Vodine was found to have the potency of liquid iodine preparations without the traditional disadvantages of being an irritant or lacking in stable iodine strength.

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HIGHER PAY APPROVED FOR ARMY PHYSICIANS AND DENTISTS

The effect of the recently passed Career Compensation Act of 1949 on the income of medical and dental officers was analyzed recently by Major General R. W. Bliss, Surgeon General of the Army. He pointed out that a physician who has completed his internship, or a graduate dentist, may be commissioned as a first lieutenant, either in the Regular Army or in the Medical or Dental Corps Reserve, and now receive total pay and emoluments amounting to $473.88 a month (if married or with dependents), or $458.88 a month (if single and without dependents). These figures compare with former pay totals of $417 and $361, respectively.

The JOURNAL LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology

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Editorial

URGENT NEED FOR GERIATRIC CARE

We are nearly always aware of the infectious disease, which makes dramatic forays and causes sudden, acute sickness. The chronic illness, on the other hand, with its quiet onset in the later years of life, makes no arresting demands for our attention. Yet these chronic illnesses of the aging group are our primary medical problem today.

Diseases of the heart and coronary arteries, cerebral hemorrhage, and cancer now account for about two out of three deaths in the upper age bracket. Diabetes, which ranked 27th as a cause of death in 1900, was 8th in 1944. Arteriosclerosis, in 34th place in 1900, was 10th in 1944. Dr. Howard Rusk reports in the September issue of the Medical Women's Journal that 75 years ago chronic diseases caused one-fifteenth of all deaths; today they cause as much as three-fourths.

Part of this increase, of course, is due to the lengthening span of life. Two thousand years ago, according to Dr. Rusk, the average length of life was 25 years; today it is 66. In 1900, one person in 25 was 65 years or older; in 1980 it is estimated that the ratio will be one in 10. By our great advances in medical and surgical care we have prevented death and produced an aging population.

And older persons need more medical care, Dr. Rusk points out. In 1940, the 26.5 per cent of the country's population over 45 required over half of the nation's medical services. It is expected that by 1980 the people over 45 will make up nearly half of the total population.

What makes the problem still more grave is that chronic disease develops most frequently among families of low income, depleting the income and the financial reserves still further. In Illinois, for instance, 23 per cent of public assistance recipients were chronic invalids; in Connecticut, 20 per cent. In New Jersey 38 of those on old age pensions were chronically ill.

When old people are well, they can get along with the essentials of housing, food and clothing. But when they fall sick, they need medical services, nursing care, and hospitalization. In most sections of the country there are simply no places equipped to care for the chronically ill. Nursing homes and rest homes are crowded to overflowing, hospitals need their beds for surgery and the more acute types of illness, and homes for old people often have inadequate infirmary facilities or none at all. In general, these homes will not accept an applicant with serious chronic illness.

These needs of old people, of course, are not entirely unrecognized. More and more forward-looking communities are redesigning their social services to include a geriatric program. In Minneapolis, for instance, the Family and Children's Service announced recently that it was expanding its services available to the aged, rich and poor alike, who are beset with problems of their advanced years.

V.L.D.

Future Meetings

The University of Minnesota announces the following continuation courses to be held at the Continuation Center on the campus:

CARDIOVASCULAR DISEASES on January 5-7, 1950. Dr. Tinsley Harrison, Professor of Medicine at Southwestern Medical College, Dallas, Texas, will act as visiting faculty member for the course.

OBSTERTICS, on December 16 and 17. The course is intended for general physicians and will be held at the Center for Continuation Study. Etiology, diagnosis, and management of obstetrical complications will be presented by means of lectures and round tables.

CLINICAL NEUROLOGY, January 30 to February 11, 1950. The course is intended for doctors of medicine who are interested in increasing their knowledge of clinical neurology. It is particularly recommended for neurologists, psychiatrists, pediatricians, internists, and neurosurgeons. Visiting faculty members consist of Dr. Fred Mettler, Neurological Institute, Columbia University, New York City; Dr. Walter Klingman, Department of Neurology, University of Virginia Hospital, Charlottesville, Virginia; Dr. Harold Veris, Neurologic Surgery, Mercy Hospital, Chicago, and Dr. Earl Walker, Neurological Surgery, Johns Hopkins University, New York City.

Cities Launch Diabetes Detection Drives

GRAND FORKS medical and health officials launched the city's second annual diabetes detection program on October 10. Those in charge included Dr. G. G. Thorgrimsen, Ruth Noren, University nurse; Dr. W. C. Dailey, Dr. L. S. Ralston, Dr. Richard Leigh, Mother Rita Claire and Sister Constant of St. Michael's Hospital; John A. Page, director of the University medical center; Harry D. Keller, manager of Deaconess Hospital; Dr. E. A. Haunz, chairman of the North Dakota detection program, and Dr. T. Q. Benson, chairman of the Grand Forks campaign.

* * *

THE DRIVE IN BISMARCK began Monday, October 10, and continued through Saturday, October 15. Dr. R. B. Radl is chairman of the committee in charge for the Bismarck Medical Club that is sponsoring the campaign.

A WINONA INTERN made the highest score in a test of cancer knowledge recently taken by 8,994 students in 32 of the nation's medical schools. He is Dr. John K. Meinert, son of Dr. Albert E. Meinert of Winona, Minnesota. The young man took the test while a senior at the University of Minnesota last spring. He now is an intern at the University of Michigan Hospital in Ann Arbor. Meinert scored 150 points out of possible 180, or 83 per cent.

American College Health Association News

A welcome is extended to all those interested in the college and university health program to assemble at the Henry Hudson Hotel, New York City, on December 29-30. The annual meeting of the American College Health Association will bring together men and women in the field of college health for the purpose of exchanging information and clarifying problems. The meeting will feature constructive discussions of subjects directed to the improvement of the health and well-being of college students.

Dr. J. E. Sawhill, New York University, Dr. Irwin Sander, Wayne University, and Dr. L. B. Chenoweth, University of Cincinnati, have organized an excellent two-day program. A change from previous years has been incorporated—that of panel discussions for every session. This method of presentation provides opportunity for participation of a larger number of the members. It permits an exchange of various points-of-view and also stimulates general discussion. Each session has been allotted sufficient time to explore the ramifications of a specific subject.

The conference is scheduled to open at 9:30 A.M., December 29, with an address by the President, Dr. Laurence B. Chenoweth. The first session at 10:00 A.M. will be a panel discussion on "The Role of Health Education in the College Curriculum" with the following participants: Dr. Edith M. Lindsay, Assistant Professor of Public Health, University of California; Dr. Herbert Ratner, Director of Health Service, Loyola University, Chicago; an administrator to be selected; and Dr. Ernest I. Stewart, Assistant Professor of Physical Education, Columbia University, New York.

At noon an Association luncheon will highlight Dr. Willard C. Rappleye, Dean of the College of Physicians & Surgeons, and Vice-President of Columbia University, on the topic, "Current Problems in Medical Education."

At 2:30 Dr. Howard Rush will be in charge of a symposium on Physical Medicine to be held at the Institute of Rehabilitation.

The morning of December 30 is divided into two parts. The first panel will be under the guidance of Dr. Ruth Boynton, University of Minnesota, and will discuss "Health Problems of Women in Colleges." Dr. Warren Forsythe, University of Michigan, will act as the moderator of the second panel discussion on "Problems of Recognition and Standards for Health Services."

A business meeting of the Association will open the afternoon session. This will be followed by a discussion of the "Problems of Nutrition as Applied to College Health" under the able leadership of Dr. Norman Jolliffe.

Dr. Sawhill, chairman of the local arrangements committee, reports that many conventions are meeting in New York on the same date. Because of the crowded conditions in hotels, Dr. Sawhill recommends making reservations immediately. You should have already received a preliminary program and a hotel reservation. If not, write directly to the Henry Hudson Hotel for your reservation.

Will each of you accept the responsibility of informing all health personnel in your institution of the annual meeting and encourage their attendance. The program committee has been working hard to formulate a worthwhile program but it needs your support to make the meeting a real success.

The Executive Committee of the American College Health Association has accepted the application for membership of the following institutions: University of New Mexico (Dr. J. E. J. Harris, Director Student Health Service), Albuquerque, New Mexico; University of California—Davis Campus (Dr. Charles L. McKinney, Director Student Health Service), Davis, California. The final election to membership of these institutions will be made by a vote of the delegates at the annual meeting in December.

Dr. John E. Gillick is the new Director of Health and Medical Services at Adelphi College, Garden City, New York.

Sarah Lawrence College also has a new college physician and Director of Health. She is Dr. Caroline F. Burpeau.

The Cook County Graduate School of Medicine, 427 South Honore Street, Chicago, Illinois, is pleased to announce the addition to its staff of John W. Neal, who will serve as Comptroller and Assistant Registrar. Mr. Neal is a graduate of Northwestern University School of Law and has been engaged in practice in Chicago for the past eleven years. He is a member of the Chicago, the Illinois State and the American Bar Associations. He is associated with the Illinois State Medical Society as General Counsel, and as Executive Secretary of its Committee on Medical Service and Public Relations. Mr. Neal is the son of the late Dr. John R. Neal, who was Dean of the Cook County Graduate School of Medicine at the time of his death.

Ohio University (5,000 students) needs two internists or general practitioners in near future to complete four-doctor staff. Experience in psychiatry or in athletic injuries desirable. No age restriction; state retirement provisions, regular hours and generous vacation periods, fine working conditions in new Health Center. E. Herndon Hudson, M.D., Director, Athens, Ohio (Phone 24532).

News Briefs

North Dakota

THE BELIEF IN A FOUR-YEAR MEDICAL PROGRAM at the University of North Dakota without immediately adding to the buildings on the campus was stated by Dr. Roy Calkins at the October 19 meeting of the Grand Forks District Medical Society. Dr. Calkins is a professor of obstetrics and gynecology at the University of Kansas Medical School. He inspected the facilities at the University and was much impressed with the new medical science building, and the "excellent, forward-looking faculty."

GROUND BREAKING CEREMONIES were held in Garrison, N. D., on Friday, October 21, for the new Garrison Municipal Hospital. Participating in the event were Dr. E. C. Stucke, retired Garrison physician, member of the hospital board and a representative of the state health department.

THE ANNUAL FALL MEETING of the North Dakota Society of Obstetrics and Gynecology was held Saturday, October 22, in the Prince Hotel at Bismarck.

The afternoon meeting featured business and scientific discussions, followed by an evening banquet. Featured speaker was Dr. John Faber of the Mayo Clinic, Rochester, Minn. Dr. Harry Wheeler, Mandan, is the retiring president and Dr. B. M. Urenn, Fargo, the incoming president.

THE NORTH DAKOTA PUBLIC HEALTH ASSOCIATION stressed the theme, "Public Health is Everybody's Business," during its sixth annual meeting from November 10 to 12 in Grand Forks. The convention's principal address was given by Dr. Franklin S. Crockett of Lafayette, Indiana, chairman of the rural health committee of the American Medical Association.

With two-thirds of the 30 members of the North Dakota Pediatric Society in attendance, the first interim meeting of the society was held at the Gardner Hotel in Fargo in October.

The society was organized last spring, with Dr. R. E. Dyson of Minot as president.

Dr. and Mrs. J. J. Stratte of Grand Forks spent the week end of October 22 in Minneapolis renewing contacts with Swedish doctors whom they had met two years ago while attending a conference of Scandinavian surgeons in Stockholm, Sweden. A delegation of Swedish doctors in this country for a two months tour of medical centers had arrived in Minneapolis to visit its hospitals and the University of Minnesota school of medicine. They were headed by Dr. John Hellstrom, chief of surgery at the University of Stockholm, an acquaintance of Dr. Stratte.

DR. L. G. PRAY, pediatrician of Fargo Clinic, presided over session of the Northwest Pediatrics Society in Minneapolis in October. Also attending were Dr. B. A. Mazur, pediatrician of Dakota Clinic, and Dr. M. H. Poindexter, who is associated with Fargo Clinic.

WHEN ST. LUKE'S HOSPITAL $380,000 building campaign opens in Fargo in a few weeks, it will have a "kitty" of $100,000 to start with, more than 700 residents of the Fargo-Moorhead area were told at a dinner in Fargo on November 2.

DR. H. B. HUNTLEY of Kindred attended the annual meeting of the Association of American Physicians and Surgeons as a delegate from North Dakota. Other delegates from North Dakota were Dr. Spears of Dickinson and Dr. Leeblar of Grand Forks.

DR. MILTON J. JOHNSON will soon take over the office of Dr. Kent F. Westley in Cooperstown. Dr. Westley left for New York City to resume studies.

Dr. Johnson received his medical degree in California and has just finished special surgical training in Colorado. He was a resident of Minnesota for 13 years.

THE MEDICAL FIRM of Drs. Wright, Lund and Johnson, of Williston, announced that Dr. Donald E. Skjei has become associated with the firm in the practice of medicine and surgery.

A graduate of Williston high school class of 1938, Dr. Skjei completed three years of college studies at the University of North Dakota and two years of medicine there. He graduated from Temple University School of Medicine at Philadelphia in 1946.

Dr. Skjei interned at St. Mary's Hospital in Detroit, Michigan, and entered the Army medical corps in 1947.

South Dakota

DR. D. H. BREIT of Sioux Falls is the newly elected president of the South Dakota branch of the American Cancer Society.

DR. E. S. WATSON, Brookings, was elected president of the State Mental Health Association at its annual meeting in Pierre on October 11.

THE REGULAR FALL MEETING of the Yankton District Medical Society was held at the state hospital on October 20. Medical students from the University at Vermillion joined the group for an address by the guest speaker, Dr. R. R. Greene, of Chicago.

Dr. Greene is professor of obstetrics and gynecology and a member of the staff at Wesley Memorial Hospital, Chicago. His subject of discussion was "Gynecological Problems and Endocrine Disturbances."

After two years of working and planning, the Platte Community Memorial Hospital was dedicated October 20. Dr. Arthur Schade of Huron, secretary of the South Dakota Hospital and Home Management Association, will manage the institution.

For the academic year 1946-47, South Dakota ranked 27th in the nation in the number of freshman medical students on the basis of population. Last year, however, it ranked seventh.

The school has graduated 646 students since its founding in 1907. Of these, 436 were resident students and through 1941 the average for state residents was 67 per cent. Hard said the average for postwar years rose to 80 per cent and presently is 96 per cent.

Only 86 of the state's 451 licensed physicians are graduates of the school, but the school's real contribution is noted in the high number of graduates supplied to neighboring states.

A new ten-room clinic opened for the examining and receiving of patients opened in Martin in October. The new clinic is under the direction of Dr. F. U. Sebring and his new associate, Dr. R. S. Westby, Jr.

New Appointments . . .

Drs. David M. Witter, Newell, and Charles Carl, formerly of the Missouri state health department, were appointed staff members at the South Dakota state health department recently.

Dr. Walter A. Patt, head of pediatrics in the Tripler General Hospital in Honolulu for the past eighteen months, has joined the staff of the Brookings Clinic as pediatrician.

A native of St. Joseph, Missouri, Dr. Patt received his M.D. from the Washington University Medical School in St. Louis in 1946 and took further training at the Miami Valley Hospital in Dayton, Ohio, and the Colorado University Medical School at Denver, and spent two years in the Army medical corps.

Dr. Thomas G. FitzGibbons of Sioux Falls has joined the medical staff of the Homestake Mining Company Hospital.

Dr. FitzGibbons is a graduate of the Creighton University School of Medicine in Omaha, took his internship at St. Joseph Hospital in Omaha and went into private practice at Huron. From 1926 to 1930 Dr. FitzGibbons held a fellowship at the Mayo Clinic and then spent several years in Army and Veterans Administration medicine.

Dr. R. W. McMullen of Texas joined the staff of the McIntosh Clinic in Eureka. Dr. McMullen received his training in Los Angeles, California, and completed his intern work in that city in 1944. For a time, he served as physician and surgeon in the mission field in China, until hostilities in that country necessitated his leaving.

Minnesota

Dr. W. L. Benedict, Rochester, was elected executive secretary-treasurer by the American Academy of Ophthalmology and Otolaryngology, a society of eye, ear, nose and throat specialists meeting in Chicago.

Dr. Jan T. Tillisch, consultant in medicine at the Mayo Clinic and the Mayo Foundation of the University of Minnesota at Rochester, was elected to the board of directors of Mid-Continent Airlines, Inc.

Appointment of Dr. P. M. Mattill as acting superintendent of Glen Lake Sanatorium, to serve until a successor to Dr. E. S. Mariette is chosen, was announced recently.

Dr. Abe Baker, head of the deparment of neurology at the University of Minnesota Medical School, spoke to members of the Red River Valley Medical Society following a recent meeting. Dr. Baker spoke about poliomyelitis, its diagnosis and treatment. Between 40 and 45 members of the society were expected to attend.

Dr. B. J. Branton, mayor of Willmar, was elected president of the Minnesota Public Health Association. He succeeds N. Vere Sanders, Albert Lea.

The fifth New Ulm medical man to be elected a fellow of the American College of Surgeons is Dr. William A. Black. He is associated with Dr. O. J. Seifert, also a fellow of the college. Other New Ulm fellows are Dr. F. H. Dubbe, Dr. Alfred and Dr. T. R. Fritsche.

Dr. Gerrit Beckering of Edgerton, Minnesota, was chosen president of the Southwestern Minnesota Medical Association at its annual meeting. Dr. Peter J. Pankratz, Mountain Lake, was elected vice-president and Dr. O. M. Heiberg of Worthington, secretary-treasurer.

Dr. Beckering and Dr. E. W. Arnold, Adrian, were elected to the state house of delegates with Dr. C. L. Sherman, Luverne, and Dr. W. B. Wells, Jackson, as alternates. Dr. Arnold and Dr. B. M. Stevenson, Fulda, will represent the association on the state board of censors.

Dr. Arthur A. Zierold, Minneapolis surgeon and University of Minnesota surgery professor, was named a member of the high ranking International Society of Surgery at their meeting in New Orleans. Dr. Zierold was scheduled to comment on a lecture on gallbladder disease by a Viennese surgeon.

Four Rochester surgeons appeared on the program of the International College of Surgeons' fourteenth assembly and convocation November 7 through 12, in Atlantic City, New Jersey. Then men are Drs. Alfred W. Adson, Albert Faulconer, Harold I. Lillie and Henry W. Meyerding. Dr. Meyerding is president-elect of the organization.

DR. W. F. WILSON of Lake City was elected secretary of the Wabasha County Medical Society for the fifty-fourth year at a recent meeting of the organization. Dr. Wilson was first elected to the secretaryship in July of 1896. Other officers are Dr. L. M. Elkstrand, Wabasha, president; Dr. William P. Gjerde of Lake City, vice-president, and Dr. Wilson, secretary-treasurer.

New Appointments and Locations . . .

DR. LEO WHITEHILL, formerly a physician with the Norwich, Connecticut, state hospital, has joined the staff at the Anoka State Hospital.

* * *

DR. E. PASEK, who has been practicing with his brother, Dr. A. W. Pasek of Cloquet, for some time, has opened an office in Carlton for full-time practice.

* * *

DR. ROBERT W. KEYES has accepted a position on the staff of the Shipman Hospital, Ely, Minnesota. During the past year, Dr. Keyes has been practicing at Hastings, Minnesota.

* * *

DR. KENNETH DOUGLAS purchased the practice of the late Dr. V. J. Telford in Litchfield and is now established there. He practiced for several years on the west coast and the last three years has been in surgery at a clinic in St. Peter, Minnesota.

* * *

DR. CARLTON NELSON of Minneapolis has joined the staff of the Worthington clinic as a surgeon, following three-and-a-half years of training at the Minneapolis General Hospital.

* * *

DR. A. S. MIDTHUNE has opened an office for practice of medicine in the village of Lake Park.

* * *

DR. R. E. STEWART, formerly of the Twin Cities and Duluth, has joined the staff of the Northwestern Clinic, Crookston. Dr. Stewart has just completed a four year fellowship in surgery at the Veterans Hospital in St. Paul and University Hospital, Minneapolis.

* * *

DR. RETA ADAMS of San Antonio, Texas, assumed her new duties November 1 on the staff of the Fergus Falls State Hospital. Dr. Adams is a graduate of the New York Medical College and has had extensive experience in mental health work.

* * *

DR. A. R. ANDREJEK of Madison, Minnesota, has joined the Henry Clinic at Milaca. Dr. Andrejek is a graduate of the University of Minnesota Medical School, took special training in obstetrics, and has just completed two years at the Madison Clinic at Madison, Minnesota.

* * *

DR. MICHAEL F. KOSZALKA recently began practicing internal medicine at 100 Lowry Avenue N. E., Minneapolis, in association with Dr. Leonard A. Borowicz.

* * *

DR. WILLIAM D. MISBACH, a native of Fairmont, opened his practice in that city in medicine and surgery in association with Dr. E. E. Zemke. For the past six months, Dr. Misbach has been receiving postgraduate training at Midway Hospital, St. Paul, and University Hospital, Minneapolis.

DR. MYERS AWARDED PLAQUE

A PLAQUE for distinguished service in the field of tuberculosis control was presented to J. Arthur Myers, M.D., chairman of the JOURNAL-LANCET editorial board, at the annual Christmas Seal dinner October 25, held at Coffman Memorial Union. The award was made by the Minnesota Public Health Association on the occasion of the publication of Dr. Myers' latest book, *Invited and Conquered,* a 700-page history of tuberculosis in Minnesota. Over 12 years in the writing, *Invited and Conquered* tells how early settlers encouraged immigration of consumptives, how Minnesota became a "resort for invalids," how through concerted effort the state is now nearing the point where it may say that tuberculosis was invited—and conquered.

Dr. Myers is a past president of the National Tuberculosis Association, Mississippi Valley Conference on Tuberculosis and the American College of Chest Physicians. He is editor-in-chief of the latter organization's official publication, *Diseases of the Chest,* and a member of the editorial board of the *American Review of Tuberculosis.*

Dr. Myers is a member of the sub-committee on tuberculosis of the National Research Council, chief of the Minneapolis General Hospital tuberculosis service, chief of the University of Minnesota chest clinic, and consultant in tuberculosis for the Veterans Administration.

DR. HAROLD S. DIEHL, dean of the University of Minnesota medical school, left the campus Monday, November 21, for Great Britain, where he and two other medical school deans will make a study of Britain's nationalized medical service. Dr. Diehl, Dr. L. R. R. Chandler, dean of Stanford university medical school, and Dr. Stanley Dorst, dean of the University of Cincinnati medical school, will study the effects of the British nationalized medical service on medical schools and medical education.

COMMEMORATING the 30th anniversary of St. Gabriel's hospital medical staff, a testimonial dinner was held October 12 at St. Francis Hall in Little Falls.

The staff was organized in 1919 with five physicians, Drs. J. G. Millspaugh, E. L. Fortier, J. B. and C. F. Folst and L. M. Roberts.

Active on the staff today are: Drs. A. M. Watson and S. W. Watson, Royalton; D. L. Johnson, R. V. Fait, R. A. Stoy, G. P. Schmitz, G. M. A. Fortier, Little Falls; C. B. Messa, radiologist, St. Cloud; R. T. Healy and R. J. Stein, Pierz; E. J. Schmitz, and R. C. Smith, Holdingford; J. T. Laughlin, Grey Eagle, and E. G. Knight and E. J. Simons, Swanville. Dr. S. G. Knight, Randall, is a retired staff member.

DR. H. P. LILLIE was named president of the Mayo Clinic staff at the annual meeting of the group on November 21. The other officers are Dr. F. P. Moersch, vice president; E. N. Cook, secretary, and Dr. C. W. Rucker and Dr. C. H. Watkins, first and second counselor, respectively.

Deaths

Dr. C. Anderson Aldrich, a children's doctor who believed that "babies are human beings," died in Rochester on October 6. Dr. Aldrich was a noted pediatrician —the director of Rochester's pioneering Child Health institute and a Mayo clinic staff member.

He came to Rochester in January, 1944, to launch the Child Health Institute—a project to guide the mental and physical health of every child born in Rochester from that date on.

* * *

Dr. Lyle L. Brown, Crookston city health officer since 1928, died October 11, ending a life-long career of public service to this community. He had suffered from a heart illness for the past several years and had been only partially active as pediatrician of the Northwestern Clinic of Crookston up to the time of his last illness.

Dr. Joseph Owen McKeon, former mayor of Montgomery, Minnesota, for eight years, died in November in San Angelo, Texas, where he had been civilian medical officer at Goodfellow army air base since June.

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Services for Dr. Robert Best, Pipestone, Minnesota, were held October 10th. Dr. Best, who had been with the United States Indian Service at Pipestone, died there October 6th.

* * *

Dr. Paul N. Jepson, orthopedic surgeon and former associate of the Mayo Clinic, died suddenly October 24th while examining patients at Pottstown (Pennsylvania) Hospital. He was a resident of nearby Phoenixville.

* * *

Dr. Hugh Legatt McLean, son of John and Jane McLean, pioneers of Dakota territory, South Dakota, died at the Veterans Hospital in Lexington, Kentucky, September 14, 1949, after a long illness, at the age of 84 years.

Meet Our Contributors

Joseph Frederick Bicek, M.D., was gradated from the University of Minnesota Medical School, specialized in obstetrics and gynecology. He holds membership in the A.M.A., the Minnesota State Medical Society, the Ramsey County Medical Society, and the Minnesota Obstetrics and Gynecological Society.

Irving Kass, M.D., is a graduate of the University of Kansas Medical School and specializes in internal medicine. He is a member of Phi Beta Kappa, and the A.M.A. Now at the J.C.R.S. Sanatorium, Spevak, Colorado, he is investigating the problem of streptomycin in tuberculosis.

Frank A. Hill, M.D., was graduated from Rush Medical College in 1940, served in the army medical department, held a three-year fellowship at the Milwaukee County General Hospital, now specializes in obstetrics and gynecology in Grand Forks, North Dakota. He is a member of the district and state medical societies, the North Dakota Society of Obstetrics and Gynecology, and the Association of Military Surgeons.

Frank W. Quattlebaum, M.D., was graduated from the University of Georgia School of Medicine in 1939, received his M.S. in surgery from the University of Minnesota in 1947, is now a clinical instructor in surgery at the University of Minnesota, and consultant in surgery at the Minneapolis Veterans Hospital. He is a member of the American College of Surgeons and the American Board of Surgery.

Henry B. Wightman, M.D., was graduated from Cornell Medical College, and is now associate professor of clinical medicine and attending physician of the infirmary at the same institution. From 1931 to 1942 he practiced pediatrics in New Rochelle, N. Y., and served on the American Board of Pediatrics in 1940. He is a member of the A.M.A., county and state medical societies, and the American Academy of Allergy.

Dorothy Pietila Siemers took a dietetic internship at the Stanford University Medical School in San Francisco, and for the past three years has been a dietitian at the Students Health Service at the University of Minnesota.

Harry Roemer McPhee, M.D., is a graduate of the Western Reserve University Medical School. Since 1933 he has been team physician at Princeton University, also serves as president of the Princeton Board of Health. He is a member of the American College Health Association and the Pennsylvania-New Jersey Student Health Association.

Ramona L. Todd, M.D., is a graduate of the University of Minnesota Medical School, and for the past seven years has been with the Students' Health Service at that school. She is a member of Sigma Xi, the Hennepin County Medical Society, Minnesota State Medical Society, and the A.M.A.

Hugh W. Hawn, M.D., was graduated from the medical school of the University of Minnesota, specializes in ophthalmology at the Fargo Clinic in Fargo, North Dakota. He is a member of the First District Medical Society, the A.M.A., the American Academy of Ophthalmology and Otolaryngology.

John H. Moore, M.D., a graduate of Northwestern Medical School, specializes in obstetrics and gynecology in Grand Forks, North Dakota. He is a member of district and state medical societies; American Gynecological Society; American Association of Obstetricians, Gynecologists and Abdominal Surgeons; Chicago Gynecological Society; Los Angeles Society of Obstetrics and Gynecology; Minnesota Society of Obstetrics and Gynecology; a fellow of the A.M.A., a diplomate of the American Board of Obstetrics and Gynecology; and a past president of the Central Association of Obstetrics and Gynecologists.



Classified Advertisements

FOR SALE

Maico Audiometer in perfect condition, used only by Maico of Fargo and guaranteed by them. $150, F.O.B. Fargo. Write Student Health Center, N. Dakota Agric. College, Fargo, N. Dak.

WANTED

Physician to join the Medical Staff of the North Dakota State Hospital. If interested correspond with Superintendent, Jamestown, North Dakota.

FOR SALE

Portable G.E. 15 M.A. X-ray for sale. Merrill W. Pangburn, M.D., Miller, South Dakota.

ASSISTANCE AVAILABLE

Woodward Medical Personnel Bureau (formerly Aznoes —Established 1896) have a great group of well trained physicians who are immediately available. Many desire assistantships. Others are specialists qualified to head departments. Also Nurses, Dietitians, Laboratory, X-Ray and Physiotherapy Technicians. Negotiations strictly confidential. For biographies please write Ann Woodward, Woodward Medical Personnel Bureau, 185 North Wabash, Chicago.

WANTED

Starting January 1, 1950, assistant or associate who has completed internship, or Fellow in surgery who needs another year or two of association with Diplomate of American Board. Write Box 893, Journal-Lancet.

OFFICE FOR RENT

Good location for general practice in Anoka. Office for rent on ground floor—downtown on Main Street. Can make money if willing to work. Equipment for sale includes good X-ray—reasonable. George H. Schlesselman, M.D., 320 E. Main St., Anoka, Minn.

FOR RENT

Office suite for rent. Three rooms or more. Over drug store on corner of 50th and France South in Edina. Will decorate to suit renter. Lease if desired. Mr. A. L. Stanchfield, 4424 W. 44th St., Ma. 3371, Wa. 4806.

Advertisers' Announcements

ROBITUSSIN

With its formulation based entirely on scientific observations, a new cough syrup, Robitussin, is being extensively promoted by A. H. Robins Company, Inc., of Richmond, Va. As a product of research, Robitussin offers now a rational approach to the management of cough. As such, the firm claims Robitussin should logically supersede and replace those empirical formulations which up to the present have widely prevailed in cough remedies. Robitussin (per 1 teaspoonful) contains: Glyceryl Guaiacolate, 100 mg. and Desoxyephedrine Hydrochloride 1 mg. (in a palatable aromatic syrup).

According to investigators who evaluated practically all the drugs used clinically as expectorants, glyceryl guaiacolate has the greatest antitussive-expectorant efficiency in increasing the secretion of respiratory tract fluid. Controlled experiments demonstrated that coughing decreased sharply and expectoration became much freer when glyceryl guaiacolate was administered to patients suffering with acute bronchitis, bronchitis with asthma, chronic pulmonary fibrosis, pulmonary tuberculosis, and the common cold.

Robitussin's second ingredient, desoxyephedrine hydrochloride, prevents or decreases spasm of the bronchial musculature thus minimizing it as a contributing factor to coughing. This ingredient, too, decreases psychic depression and fatigue, according to laboratory evidence. Also, Robitussin is said to be one of the most palatable of all antitussive-expectorants.

AQUEOUS VITAMIN A SOLUTION

U. S. Vitamin Corporation, and its affiliate, Casimir Funk Laboratories, Inc., announce the acceptance of their Aquasol Vitamin A Drops by the Council of Pharmacy and Chemistry of the American Medical Association. As stated in a recent full page, two-color advertisement in the Journal of the American Medical Association, this is the "first and only" aqueous vitamin A solution to be accepted by the Council.

Extensive clinical studies now prove conclusively that aqueous solutions of vitamin A, as provided in Aquasol Vitamin A Drops, are more rapidly absorbed than vitamin A in oil solutions. This makes Aquasol Vitamin A Drops especially useful in patients with dysfunctions of the liver, pancreas and biliary tract which interfere with utilization of fats; in celiac disease and certain other diarrheal states.

The Research Laboratories of U. S. Vitamin Corporation in 1943 pioneered and developed the making of aqueous solutions of fat-soluble vitamins and the process is protected by U. S. Patent No. 2,417,299. Aquasol Vitamin A Drops is one of several U. S. Vitamin preparations providing the advantages of aqueous solutions of fat-soluble vitamins. Detailed literature is available from U. S. Vitamin Corporation, 250 East 43rd Street, New York 17, New York.

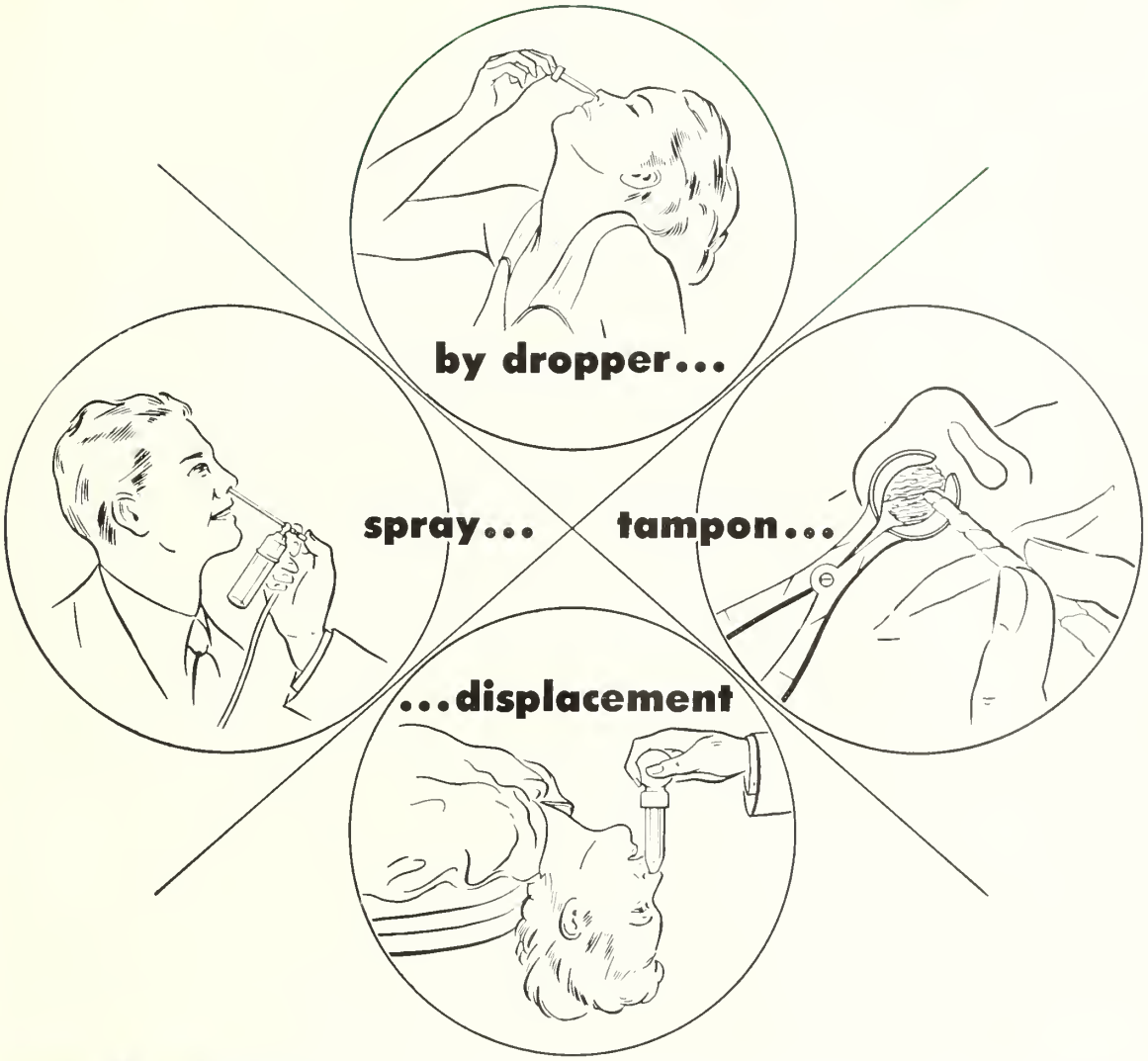
"OLOTHORB" CAPSULES

Sharp & Dohme, Philadelphia, has announced the national release of "Olothorb" Capsules, a preparation which accelerates the absorption of fat in the small intestine.

Polyoxyethylene sorbitan monooleate, the active ingredient in "Olothorb" Capsules, is an emulsifying and wetting agent. When mixed with foods, it aids in the emulsification of fats, bringing about a more homogeneous mixture and thereby inducing more complete absorption of fats in patients with chronic diseases of the gastro-intestinal tract and in those who have been subjected to certain operations on the intestinal tract.

Large amounts of this compound have been administered to patients over a period of months without the appearance of any toxic symptoms, and with great benefit to their nutritional status. Among the conditions that may be aided by administration of "Olothorb" Capsules are ulcerative colitis, ileitis, nontropical sprue, celiac disease and pancreatic fibrosis. Following

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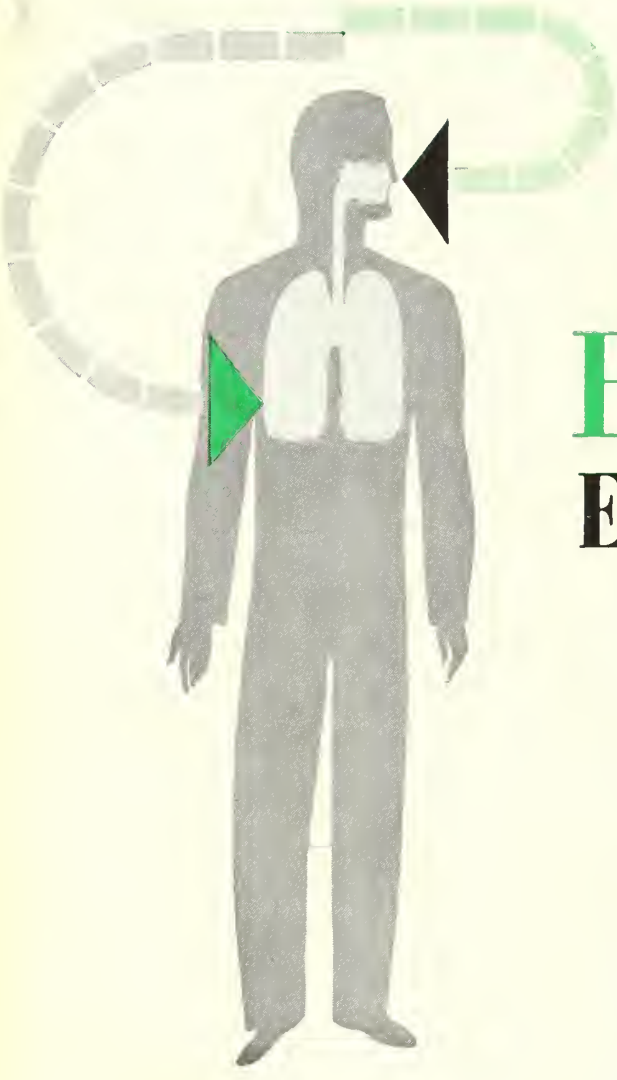
¼% solution (plain and aromatic), 1 ounce bottles; 1% solution, 1 ounce bottles; ½% water soluble jelly, ⅝ ounce tubes.

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The antispasmodic and decongestant action of BENYLIN EXPECTORANT combats cough, relaxes the bronchial tree, diminishes bronchial congestion and alleviates nasal stuffiness, sneezing and lacrimation. Containing no narcotics, BENYLIN EXPECTORANT combines Benadryl® hydrochloride, 10 mg. per teaspoonful, with other remedial agents for safe, effective control of coughs due to colds as well as those of allergic origin.

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promotes liquefaction and removal of mucous secretions from the respiratory tract. The demulcent action of its vehicle soothes irritated mucosa. Acceptable alike to children and adults, its pleasant, mildly tart taste avoids the objections to cloying, overly-sweet preparations.

DOSAGE: One or two teaspoonfuls every two to three hours, as soon as possible following appearance of symptoms. Children, ½ to one teaspoonful every three hours.

BENYLIN EXPECTORANT contains in each fluid ounce:

Benadryl Hydrochloride (diphenhydramine hydrochloride, P. D. & Co.)	80 mg.
Ammonium Chloride	12 gr.
Sodium Citrate	5 gr.
Chloroform	2 gr.
Menthol	1/10 gr.

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